ND Works
SUMMER2016
News for Notre Dame faculty and staff and their families

PHOTOS: BARBARA JOHNSTON

Research scientists, llama farmers

Sharon Stack and Matt Ravosa

MATT CASHORE

BY CAROL C. BRADLEY, NDWORKS

Sharon Stack and **Matt Ravosa** joined the University in 2011, coming from positions at the University of Missouri School of Medicine in Columbia, Missouri.

Stack is the Ann F. Dunne and Elizabeth Riley Director of the Harper Cancer Research Institute (HCRI) and the Kleiderer-Pezold Professor of Chemistry and Biochemistry; Ravosa is a professor of biology with concurrent appointments in the Department of Aerospace and Mechanical Engineering and the Department of Anthropology.

Stack completed her doctorate at the University of Louisville; Ravosa at Northwestern. The couple met as postdoctoral scholars at Duke University Medical Center in Durham, North Carolina.

"We met in a bar," Stack says. "At Friday Happy Hour. A Duke University campus hangout. He was with his lab mates, and I was with mine. He walked by and handed me a paper, and said 'Did you drop this?' I didn't look at it till the next morning. It said, 'Hi, my name is Matt. I'd like to meet you. If you'd like to go to dinner call me,' with a phone number."

The next morning she found the note in her pocket but couldn't remember who'd handed it to her. She looked his name up in the university directory, where he was listed as a visiting research professor. With some coaxing from her friends, she called. The first night they went to dinner, the next day they spent at the North Carolina State Fair, Stack says.

"We had a blast working and dancing a lot, got married and Matt took a job at Northwestern University Medical School in Chicago. I moved there about nine months later."

Northwestern wasn't her first choice. "I said I'd move anywhere but New York, Los Angeles or Chicago. We were in Chicago for 13 years, and I only complained for the first 10. When the kids (Nico, now 18, and Luca, now 16) came along, we decided to move on." Stack and Ravosa both took positions at the University of Missouri, School of Medicine then on to South Bend and Notre Dame.

Stack and Ravosa live on 22.5 acres near Edwardsburg, Michigan (technically the Cass County part of Niles), with a menagerie that includes (as Ravosa likes to say) "eight llamas, two alpacas, three dogs and two boys."

After they bought the property, he cut the lawn once. "I decided I needed some animals to eat the grass." The llamas are all rescue animals and earn their keep by cropping some of the five or six acres of fenced pasture. The alpacas are also rescue animals, acquired from a friend who was shutting down a research project on

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INSIDE

NEWS BRIEFS

GERHOLD TO LEAD LICENSING PROGRAM

Tomi Gerhold has been promoted to interim director of the Notre Dame Licensing Program, following the retirement of Mike Low. She previously worked as the associate director of the Licensing Program and will immediately begin serving as a senior leader on the Auxiliary Operations team.

Gerhold will be responsible for managing and protecting the University's trademark licensing program. She will also guide the day-to-day operations of the program; continue to serve as a member of the Licensing Committee, as well as the campus Worker Participation Committee; and serve as the department's liaison to the University's licensing agency, Fermata Partners.

BURKE NAMED DIRECTOR OF THE INSTITUTE OF GLOBAL INVESTING

Kevin W. Burke '89, a member of Notre Dame's Wall Street Leadership Committee, has been named the first managing director of the Notre Dame Institute of Global Investing at the Mendoza College of Business. Burke retired as president of Conatus Capital in December 2015.

Burke will be responsible for implementing the vision of the institute and managing its operations, including developing and directing curriculum and programs, mentoring students, and recruiting and coordinating faculty to participate in the institute's programs. He will work in collaboration with the institute's faculty director, finance professor **Shane Corwin.**

UNIVERSITY ONE OF THE 2016 'BEST PLACES TO WORK IN IT'

Recognized for the fourth year in a row, Notre Dame rises to sixth among large organizations in IDG's Computerworld 2016 Best Places to Work in IT.

The 23rd annual survey ranks organizations that provide challenging work for information technology employees while providing great benefits and compensation. Notre Dame is featured, along with other recognized organizations, in the June 13 digital edition of Computerworld and online at **computerworld.com.**

A&L PROFESSORS RECEIVE GUGGENHEIMS

Anjan Chakravartty, a professor in the Department of Philosophy, and **Stephen Fallon,** the Rev. John J. Cavanaugh, C.S.C., Professor of the Humanities in the Program of Liberal Studies and the Department of English, are recipients of 2016 John Simon Guggenheim Memorial Foundation fellowships.

Fallon will use his fellowship to complete a comparative study of what happens when the poet and theologian John Milton and the scientist and theologian Isaac Newton — towering figures in 17th-century England — address some of the world's biggest questions and come up with parallel answers.

Chakravartty, who directs the Reilly Center for Science, Technology and Values, will explore how people should think about the rationality of their beliefs in the face of disagreement among experts.

UNIVERSITY TO STEWARD NEWMAN UNIVERSITY CHURCH IN DUBLIN

The University has agreed to steward Newman University Church in Dublin, and to found there the Notre Dame–Newman Center for Faith and Reason.

Built by the then-rector of University College Dublin, Blessed John Henry Newman, the church opened in 1856 and has since been an iconic landmark in Dublin's city center and a testament to the harmony of faith and reason. Newman would later be named a cardinal of the Catholic Church, and was beatified by Pope Benedict XVI in 2010.

The center's operations will commence later this fall, and will have a special focus on outreach to young professionals in Dublin, many of whom have not otherwise been drawn to the Catholic Church. The center will give particular attention to excellent liturgy and music, a lecture series and other intellectual activities that aim to integrate faith and reason, service to those in need in Dublin and cultural events inside and outside of Newman University Church.

UNIVERSITY EXPANDS PARTNERSHIP WITH STAMPS FOUNDATION

The University welcomes 11 undergraduate Stamps Scholars to the Class of 2020, marking an expansion of the partnership between Notre Dame and the Stamps Family Charitable Foundation. The partnership began in 2013, with the admission of five scholars each year since. The prestigious scholarship awards have now doubled to allow twice as many students per year to benefit from the scholarship.

The Stamps Family Charitable Foundation, established in 1986 by Penny and Roe Stamps, sponsors multi-year merit scholarships at 41 institutions across the United States with the goal of helping exceptional students become meaningful leaders throughout society.

MATT CASHORE

Gerhold

PETER RINGENBERG

Johnson

BARBARA JOHNSTON

Shibata

JASON MARK BRYANT

Chakravartty

MATT CASHORE

Fallon

Johnson promoted to senior director of campus safety; Shibata appointed NDSP police chief

BY DENNIS BROWN, MEDIA RELATIONS

University police chief **Phillip A. Johnson** has been promoted to senior director of campus safety and emergency management, and **Keri Kei Shibata** will succeed him as chief of Notre Dame Security Police (NDSP).

Chief since 2007, Johnson has concurrently been responsible for directing Notre Dame's emergency management efforts for the past two years.

He will continue in the latter role, managing a program that includes extensive annual training to more than 300 campus leaders, multiple simulations and tabletop exercises, management of the campus-wide NDAlert emergency notification system, and coordination with local, state and national law enforcement, fire departments, emergency medical services and others in the field. He also interacts with numerous other higher education institutions in identifying best practices in safety and emergency management.

"Nothing is more important than the safety of students, faculty, staff and visitors on our campus, and that is especially true in the event of an emergency," said Rev. John I. Jenkins, C.S.C., Notre Dame's president. "We are exceptionally blessed to have a person with Phil's experience and knowledge leading these critically important efforts."

Johnson also will assist **Mike Seamon,** vice president for campus safety and event management, with the daily operations within the campus safety division, which is composed of the NDSP, Notre Dame Fire Department, Office of Risk Management and Safety and emergency management. He also will be responsible for assisting in the coordination and implementation of various safety elements associated with major University events, including commencement, Alumni Reunion Weekend and home football game weekends.

A 12-year veteran of the NDSP, Shibata most recently has served as deputy chief for safety services. She previously has been responsible for the University's 911 dispatch center, crime prevention and outreach, security and guest services, Clery Act reporting, training for NDSP personnel and campus safety officers, including security support of all residence halls on campus. A sworn police officer, Shibata focuses on campus law enforcement, sexual assault, domestic violence and the Clery Act.

"Keri Kei is a talented law enforcement officer who has demonstrated excellence in every role she has filled with NDSP," said **John Affleck-Graves,** executive vice president of the University. "I look forward to working closely with her, Phil and Mike as we seek to provide a safe and secure environment for all who live, work and visit here.

MATT CASHORE

OLD2GOLD RAISES $33,000 FOR CHARITY

The 2016 Old2Gold sale, held Saturday, June 11, at the 4-H Fairgrounds, was staffed by 186 volunteers and visited by more than 1,755 shoppers — including some who lined up for the 7 a.m. start of the event as early as 4:30 a.m. The event, which featured clothing, bicycles, electronics and other goods donated by Notre Dame students, raised $33,000 for 21 local community service organizations.

CONTACT US @

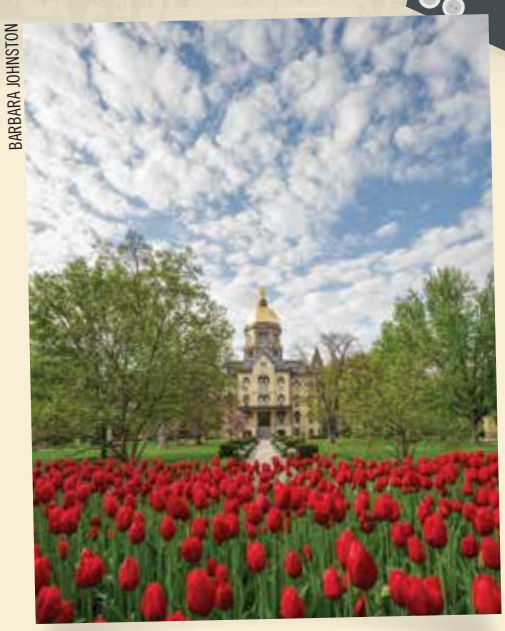
Comments or questions regarding NDWorks? Contact NDWorks Managing Editor Carol C. Bradley, 631-0445 **(bradley.7@nd.edu)** or Cidni Sanders, editor and program director for Internal Communications, 631-7031 **(csander6@nd.edu).** For questions regarding The Week @ ND or the University calendar, contact Electronic Media Coordinator Jennifer Laiber, 631-4753 **(laiber.1@nd.edu).** NDWorks is published 11 times per year. 2016-2017 publication dates are July 7, Aug. 18, Sept. 22, Oct. 27, Dec. 8, Jan. 5, Jan. 26, Feb. 23, March 23, April 20 and May 18.

Enter NDWorks 2016

PHOTO CONTEST!

BRETT FOX

JEFF MILLER



BARBARA JOHNSTON

Win a photo by Barbara Johnston or Matt Cashore!

The 2016 NDWorks Photo Contest has already received more than 50 entries. Submit your photos of campus places, people and things by August 26 to be eligible for prizes including an 11 x 14-inch print of one of the many beautiful campus photos available on **photos.nd.edu.**

We're looking for photos of sights those who work on campus see that visitors may not: the beauty of campus at sunrise and sunset; hidden spots; close encounters with the squirrels that call Notre Dame home.

Photos can be taken with any camera or device but must be a high-resolution jpeg (300 dpi with a file size of 1-2 MB.)

Submissions on our Pinterest page where they can be liked, saved or shared (create a free Pinterest account to view all the submissions). You can see both current and last year's entries at **pinterest.com/UofNotreDame/notre-dame-iphone-ography**.

Copyright remains with the photographer. Each digital image submitted should be labeled with your name and a title (i.e., yourlastname_tulips.jpeg) Email submissions and any questions to Carol C. Bradley, **bradley.7@nd.edu**.

MORE NEWS

MCAWARD TO DIRECT CENTER FOR CIVIL AND HUMAN RIGHTS

MATT CASHORE

McAward

Jennifer Mason McAward, associate professor of law at the Notre Dame Law School, has been appointed director of the University's Center for Civil and Human Rights (CCHR) by R. Scott Appleby, Marilyn Keough Dean of the Donald R. Keough School of Global Affairs.

The CCHR sponsors two degree programs through Notre Dame Law School to respond to the worldwide need for advanced human rights education: a one-year Master of Laws (LL.M.) program and a multi-year Doctorate of Juridical Sciences (J.S.D.) program.

A member of the Notre Dame faculty since 2005, McAward teaches and conducts research on civil rights, constitutional law and habeas corpus. Her scholarship addresses the relationship between Congress and the federal courts with respect to protecting individual rights.

BARRON APPOINTED DPAC EXECUTIVE DIRECTOR

MATT CASHORE

Barron

Ted Barron, senior associate director of the DeBartolo Performing Arts Center (DPAC) has been appointed executive director of the center and Judd and Mary Lou Leighton Director of the Performing Arts. He has served as interim executive director since the departure of Anna Thompson last fall.

Barron has served as senior associate director since 2010 and has led the visits to Notre Dame by filmmakers such as Claire Denis, Larry Karaszewski, Margarethe von Trotta, Martin Sheen and Emilio Estevez. He teaches courses on film history in Notre Dame's Department of Film, Television and Theatre.

Lynda.com licenses available at reduced rate

Interested in taking advantage of online training through **lynda.com**, one of the premier online training sites?

Annual licenses for lynda.com are available to ND faculty, staff, students and affiliates for only $12 each. A license provides access to more than 4,500 different online training courses, from PowerPoint to Python to podcasting.

Licenses can be purchased for one person or a group for individual departments or colleges. Faculty members can have students in their classes buy a license as well.

These premium licenses give access to the exercise files used in the tutorials. The licenses are for individuals only and cannot be shared among coworkers; each person needs a separate license.

Order one or multiple licenses anytime after Friday, July 1. Licenses will remain active until approximately June 30, 2017.

There are a limited number of these licenses available. Monthly licenses will no longer be available through the Office of Information Technologies (OIT).

More information about these licenses and how to place an order can be found at **oit.nd.edu/training-classes/online-classes.**

New insideND launches August 1

LENETTE VOTAVA, OIT

The new iteration of **insideND** will be available to all faculty, staff and students beginning Monday, August 1.

Powered by One Campus, the new insideND provides access to many Notre Dame services without logging in with a netID and password. But logging in will allow access to more options, including the ability to mark favorites and to learn more about a service or application.

Preview the features now by opening any browser and going to **newinside.nd.edu**.

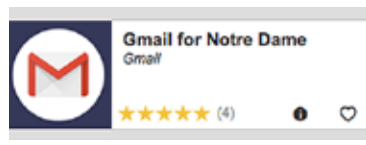
In the new insideND, you can search for different services including Gmail, Sakai, Calendar and more.

You can open the service or application by clicking anywhere in the application box.

For commonly used services or applications, click on the "heart" icon to mark it as a favorite. The icon will be listed under the category "My Favorites" so you can easily access them again.

The "i" icon provides you with details about the service or application and contact information. In addition, rate the service or application by going to the "Ratings" tab once you've clicked on the "i" icon.

Though many services and applications are searchable in the new insideND, there are some still being added to the site. If you are not able to find the application you are searching for, send a message by clicking on the login drop-down menu and choosing Send Feedback.



Here are a few helpful tips to remember after the launch date:

- The URL will still be **inside.nd.edu.**
- All bookmarks saved in your browser for the current insideND will need to be recreated after the new insideND launches on August 1.
- If you bookmarked **newinside.nd.edu,** it will continue to work properly after August 1. It is not necessary to recreate it.
- Any task you mark as a favorite in the new **insideND** will remain as a favorite after August 1.
- If you reference information within the current **insideND** on any form of departmental communications for staff, faculty and students (website, email, how-to instructions, etc.), please be sure to adjust them accordingly.

Stay up to date on the progress of the new **insideND** and the latest demonstration sessions, or take a look at the how-to video and find answers to frequently asked questions by visiting **ntrda.me/newinsidend.**

If you have questions, contact the OIT Help Desk at 574-631-8111, **oithelp@nd.edu** or chat online at **help.nd.edu.**

Cover Story *(continued from page 1)*

An academic couple: Researching cancer biology and evolution

animal feeding behavior and biomechanics at Ohio University.

The llamas are named after types of pasta — Bucatini, Orecchiette, Fusilli, Ditalini, Gnocchi, Tagliatelle, and her daughter, Ziti. The alpacas are named after pasta sauces, Aglio e Olio and Carbonara. The dogs (not to leave anyone out) are June Bug, Stella and Fenway.

Older son Nico just graduated from Edwardsburg High School, and will be attending Western Michigan University as a mechanical engineering major in the fall. Luca is a junior at Edwardsburg High School.

They hadn't intended to make another move after Missouri, she says, "But this was such a great opportunity for me. It's been a great challenge to build a basic cancer research institute from scratch. The job has been made easier by the strength of the faculty, at both Notre Dame and the Indiana University School of Medicine, South Bend."

The Mike and Josie Harper Cancer Research Institute in Harper Hall, dedicated in March 2011, comprises 55,000 square feet of office and research laboratory space and is located adjacent to Raclin-Carmichael Hall, which houses the IU School of Medicine, South Bend. The buildings are located on the south side of the intersection of Notre Dame Avenue and Angela Boulevard.

Part of the funding for Harper Hall came from the family foundation of the late Charles M. "Mike" Harper, a former South Bend resident and the retired chair and chief executive officer of ConAgra Foods. Harper made a $10-million contribution to Notre Dame to support its cancer research programs, and the gift was matched with a $10-million appropriation from the state of Indiana to Indiana University for the project.

MATT CASHORE

Stack

There are very few cancer centers engaged in the level of interdisciplinary collaboration with engineers to the level of the HCRI, Stack notes. "The Koch Institute at MIT is one example. We are able to do this and do it well because of the collaborative nature of the faculty here. Collaboration is our foundational principle."

Her areas of research interest include tumor metastasis, ovarian cancer, oral cancer, cell and molecular biology. Stack has published more than 155 peer-reviewed research articles and reviews, and she was elected a fellow of the American Association for the Advancement of Science in 2012.

In addition to faculty members from the Colleges of Science and Engineering, HCRI also has several faculty from the College of Arts and Letters, "focusing on quality of life and end-of-life issues," Stack says, including psychology professor **Thomas V. Merluzzi.**

Merluzzi studies coping processes in people with cancer, as well as in cancer survivors.

As an example of cross-disciplinary collaboration, Stack notes the work of **Hsueh-Chia Chang,** the Bayer Professor of Engineering and director of the Center for Microfluidics and Medical Diagnostics. Chang is working with **Reginald Hill,** assistant professor of biological sciences, on an early detection method for pancreatic cancer. According to Stack, detecting pancreatic cancer even several months earlier could make a dramatic difference in outcomes for the patient. Pairing an engineer and biologist to tackle one of the deadliest forms of cancer is the kind of innovative approach that was central to Harper's founding.

"We're trying to get researchers who perhaps don't think about cancer research, but who have strong scientific methods and approaches, and let them know what our questions are," Stack says.

Growing up in South Carolina and Massachusetts

Stack grew up in South Carolina and went to a rural high school that didn't offer much science "other than leaf collecting and dissecting tapeworms. In college (at Clemson University), I intended to be a math major."

When she arrived for classes, she needed to pick a major, but the math adviser was out at the time, "I picked biochemistry out of the catalog. I didn't even know what it was."

She completed a major in biochemistry and spent a year in Bonn, Germany, as a Fulbright Scholar. "That was life-changing, to go from a small town to Bonn. By myself. It was the first time I saw a map of the world and the U.S. wasn't in the middle."

Ravosa grew up in a town called Longmeadow, Massachusetts, "which has the longest green, or town commons, in the state of Massachusetts," he says. "It was incorporated in 1644. So I'm from a part of the country with an historical perspective on things.

"Maybe I'm interested in evolution because I'm from a part of the country that has history. I was always interested in how heads are put together the way they are. That's the common theme throughout my entire research career, what makes heads diverse. Why do they look the way they do?"

When he visited Edwardsburg Middle School for Career Day recently, he got the question he's frequently asked, "Were you interested in dinosaurs?"

"That was me as a kid," he says. "Dinosaurs have wicked cool heads. Why does this one have a head that does this, and another a head that does that? They used to head-butt each other. I've always been interested in skulls and how diverse they are. I never got far away from that."

CAROL C. BRADLEY

Director Sharon Stack leads a group on a tour of the Harper Cancer Institute's laboratory facilities at the institute's annual open house, held on June 28.

Some common research interests

Stack and Ravosa do share some common research interests. Stack is interested in how mechanical forces affect tissues. "In tumors, you feel something hard in something soft. Ravosa's focus is on whole animals and how mechanobiology (the interface between biology and engineering) affects evolution." The couple has a collaborative research project focusing on the relationship between mechanical loading and tissue remodeling in the development and aging of the jaw.

Ravosa has published close to 100 peer-reviewed research articles, books and reviews. He was elected a fellow of the American Association for the Advancement of Science in 2008.

Ravosa's research is conducted with rabbits, which chew like humans and other primates, he says. Changes in the skull come from changes in the diet — what the animal is chewing. It's something that can be quantified, but not from fossils. "The way we study skulls has changed radically. Questions are coming from fossils, but I go there last, not first," he says. "If you want to understand living organisms, you have to study live organisms."

The technology has also changed radically, he notes. "We used to just look at the skulls and take measurements directly or take X-rays of them. Now we work with live animals. We do physiological recording. Then we look postmortem at the tissues, the cells, the genes. We use engineering approaches to skulls — why are they constructed the way they are? Then we put it all back together so we understand the genes that encode the proteins that result in differences in the biomechanical properties of the tissues that are affected in different ways, depending on what you do when you're alive.

"That gets us to what starts to fail as you get older," he says. "The cartilage goes first, before the bone goes. If you look at the bone and the cartilage together, you can understand what's happening as it's starting to degenerate. That long-term perspective is really a critical part of what we do."

For example, consider the Tyrannosaurus Rex. "The T-Rex used its teeth to slice and swallow. Teeth are tools, like chisels. Mammals take something and process it orally—that can take a lot or a little time, depending on what it is. Teeth are tools that you apply to those foods, and those foods require you to impart forces to them. Those forces affect the way the tissues grow.

Bones that experience more forces grow more. "It's kind of like the couch potato thing," Ravosa says. "If your kids get up and off the couch and move more, they will have larger bones when they stop growing."

"As animals chew certain things, their jaws become more robustly constructed. What might be driving those changes? Can we induce change?"

The research has implications for humans as well.

"If you don't walk around very much, or you don't exercise very much, you'll develop osteoporosis. No one has ever developed osteoporosis of the brain case. So in other words, it suggested to us that there must be different things that control

BARBARA JOHNSTON

Carbonara the alpaca gets a shower.

MATT CASHORE

Matt Ravosa uses a llama skull to point out some of the differences in the bone structure of animal skulls. The skull, purchased online, was a birthday present from Sharon and their sons.

bone formation in different parts of the skull."

There are two other interesting things about bone development in the skull that differ from bone development in other parts of the body, he adds.

"When we are really little, bones start off as cartilage, and they become replaced by bone. When they become fully bony, we stop growing. In the head, most of the bones don't grow that way. They start off as soft tissues, and go straight to bone. A baby's soft spot, there's nothing there. There's skin and soft tissue and brain right below it. There's no cartilage there. And it turns into bone. That only happens in the head."

Another unique aspect of bone growth in the skull is that the bone comes from two tissue types. The bones in the body come from only one. So there are three things affecting bone growth in the skull: a diversity of loading environments (chewing on different types of food, harder or softer, effecting changes in the jaw); a diversity of tissue types — the precursors of bones; and a diversity in the way the bone forms.

Ravosa's research examines the ways bone cells vary in neonatal mice. "You would assume that bone is bone is bone — that one bone acts the same way as another bone, that a bone cell acts the same way as another bone cell," he says. "We're starting to find that depending on what part of the bone you pick a bone cell from, its activity is very different. If you're going to do reconstructive surgery, you need to use the right tissue from the right spot."

That's just one clinical application. Developing a model for osteonecrosis of the jaw from chemotherapy is another. Although his research may have clinical applications, he's primarily interested in bone from an evolutionary perspective.

"Why do some animals have a complete bar around the eye socket and other ones don't? A lot of it is asking those kinds of questions — if you're an animal that has this kind of joint, you're probably in a group of animals that all look like that. You can ask questions—compare one animal to another.

"What we're doing is exemplary of the way science needs to be done, has to be done. It's cross-disciplinary. An engineer has a different take on science that a biologist. You have to incorporate new skills from other disciplines. That's how you get advances. My post-docs are bioengineers. My students have engineers on their dissertation committees. I may be one of the few faculty members on campus with concurrent appointments in two other colleges," Ravosa says. Indeed, having engineers as colleagues was a big part of his initial attraction to Notre Dame.

Breakthrough research on ovarian cancer

Sharon Stack's current research and grant writing focuses on ovarian cancer.

Nearly 70 percent of ovarian cancer cases are detected after metastasis, which is the development of secondary malignant growths distant from the primary site of cancer, resulting in a five-year survival rate of less than 30 percent.

Stack's laboratory emphasizes the understanding of the molecular mechanisms by which tumor cells manipulate micro-environmental cues in order to more efficiently metastasize. Knowing how cancer spreads is a key step in stopping the metastatic process in this late stage.

Recently, alongside HCRI researcher **Yueying Liu,** she led a team of researchers in a study that found that obesity contributes to ovarian cancer metastasis. The team used an integrative approach combining three-dimensional cell culture models, tissue explants and mouse models to evaluate tumor cell adhesion to cells that line the abdominal cavity.

The researchers set out to determine whether obesity contributes to ovarian cancer metastatic success. In other words, are tumor cells better able to successfully metastasize when the "host" is obese versus lean?

"Ovarian cancers metastasize through a distinct mechanism that results in large numbers of lesions anchored throughout the abdominal cavity, making surgery challenging," Stack says. "It's important to delve deeply into understanding ovarian cancer on a molecular level and identify disease-specific targets. Not only will this help us find cures, but it will also assist in early detection efforts that are important for survival."

The hope is that further research will provide new targets for dietary and therapeutic interventions to slow or inhibit metastatic dissemination — thereby impacting the long-term survival of women with ovarian cancer. "We are just at the beginning of understanding this complex disease," Stack says.

The study was supported by grants from the National Cancer Institute and the Leo and Ann Albert Charitable Trust and by training fellowships from the National Cancer Institute and the National Science Foundation.

Stack also points out the interdisciplinary nature of the research.

"In addition to the cell-based research, we analyzed hundreds of fluorescent images and many hundreds of slides to collect the data to support our conclusions," she says. "We had phenomenal interactions with the Harper Tissue Biorepository and the Notre Dame Integrated Imaging Facility. You can see the team effort by looking at the author listing: This paper has 22 authors. Seven of them are current or former Notre Dame undergrads, and four are current or former ND grad students."

In May, the University hosted the Midwest Ovarian Cancer Coalition. Researchers examined the current state of ovarian cancer research and discussed ways they might collaborate to more effectively combat the disease.

"The goal was to bring together research groups and share our findings, as well as to learn from survivors and advocates," says Stack. "We want all women to have better treatment options and early detection."

Matt Ravosa showers Aglio e Olio (left) and Carbonara (right) on a hot June afternoon.

BARBARA JOHNSTON

Eight receive Green Belt certification


MATT CASHORE

From left, Aaron Wilkey, Lin Wang, Margaret Morgan, Jonathan Retartha, Ryan Knowlton, Lindahl Chase, Karen Putt (not pictured, Bernard Akatu).

Projects created substantial process improvements in several areas

BY ANGELA KNOBLOCH, CONTINUOUS IMPROVEMENT

In May, the University awarded Green Belt certifications to eight individuals who participated in the Green Belt Program offered by the Office of Continuous Improvement. Since the program launched in 2010, 86 Notre Dame employees have achieved Green Belt certification.

Bernard Akatu, in the Office of Human Resources, entered the Green Belt program with a process problem that seemed to be a fairly straightforward issue. The Office of Human Resources was processing non-employee NetID request paper forms and wanted to reduce the inefficiency of handling these forms.

"I was fairly certain that if we could just devote time to analyzing the process, we would realize huge benefits for both Human Resources and campus users," says Akatu. "However, as we began to evaluate the data gathered from the process, we quickly realized that there was a need to not only eliminate the inefficiencies, but also mitigate potential risks to the University by incorporating the expertise of the Office of Information Technology (OIT) into the improved process."

Project sponsors **Tammy Freeman** and **Mark Kocovski** from Human Resources encouraged Akatu to propose a new process that would fully achieve these goals.

"Bernard's improvement proposal initially stopped just short of what we all knew really needed to happen," says Freeman. "It was clear that this was not a Human Resources process and that the OIT was in a better position to field the requests for non-employee NetIDs."

Akatu then approached **Katie Rose,** director of user services, with a proposed future state process. Says Rose, "It made sense for the OIT to help with the new process, but the new process also presented the perfect opportunity to use ServiceNow to gather and track these requests. This wasn't a case of someone just trying to push a process onto another department. We clearly saw the need for the OIT to work with these requests, and we were able to make the process more efficient by taking advantage of the automation that ServiceNow can provide."

The partnership between Human Resources and the OIT Help Desk, which assumed responsibility for the process, has been the key factor in the impressive results. Most campus requestors seeking a NetID access for a non-employee (affiliate) receive confirmation within two working days. Additionally, the University has improved the trackable data of all non-employee access.

The Office of Housing also recognized a need for improving efficiencies in the annual housing selection process. They experienced a great deal of re-work in the application process and identified a need to better communicate with students and rectors.

Says Green Belt leader **Margaret Morgan,** "We had to go back to the beginning and determine what was critical in the process for students, rectors and the Housing Office itself. With this discovery, we were able to target the essential areas in which to focus."

One obvious observation was that students were asked to complete housing applications prior to notifications on study abroad status. As a result, students accepted into study abroad programs had to cancel their applications, requiring additional manual work for the Housing Office. By adjusting the timeline to delay the application process until after the study abroad notifications were made, the Office of Housing experienced a 45 percent decrease in cancelled applications from the previous year.

Students weren't the only ones experiencing a better process this year. "A key goal of ours was to engage the rectors in streamlining the overall process," says Morgan. "Rectors' greatest need was the ability to form communities. Our improved process allowed for this need while creating greater awareness of shared work between the Office of Housing and rectors for room selection."

Response from the rectors has been very positive. The revised policies and process also provided better service and consistency to our undergraduate students.

Green Belt Certifications

Bernard Akatu, Human Resources: Implemented a new process for requesting affiliate NetID access restoring approximately 679 hours annually. Campus requesters now have their requests fulfilled within two work days of submission with less than one percent requiring rework.

Lindahl Chase and **Jonathan Retartha,** Development: Improved the campaign execution process with better targeted, more creative donor-centric tasks resulting in a 7.5 percent increase in unrestricted revenue from previous year.

Ryan Knowlton, OIT: Reduced the time to obtain VPN-DC access from 12 days to 4 days.

Margaret Morgan, Housing Office: Improved the annual housing selection process with a student-focused timeline that took into consideration study abroad notifications and RA selections, resulting in 45 percent decrease in re-work for the Housing Office staff.

Karen Putt, Enrollment: Implemented a centralized process for college fairs resulting in improved data to assess effectiveness of college fairs as a recruitment method, the ability to recognize volunteers for their efforts and establishment of historical data for improved fair selection by volunteers.

Lin Wang, Development: Reduced production lead time in the storytelling and engagement process by over 50 percent and created capacity to accommodate increasing demand.

Aaron Wilkey, OIT: Using newer information security tools, created new password standard and revised the password policy eliminating the need to change password every 180 days — reducing the need for campus users to contact the OIT Help Desk for password resets due to forgotten password. OIT Help Desk recovered approximately 635 hours annually as a result, while campus users collectively will recover over 300 hours annually.

For additional information regarding the Green Belt program, contact the Office of Continuous Improvement, **oci@nd.edu** or call **Carol Mullaney,** 631-1293.

Mullaney honored as 'Leader of Change'


MATT CASHORE

Mullaney

Carol Mullaney, director of the Office of Continuous Improvement, has been honored by the Network for Change and Continuous Innovation: Higher Education's Network for Change Leadership (NCCI) as a 2016 Leader of Change.

The recognition program identifies leaders of change throughout higher education, recognizes them for their accomplishments, and links them with their peers to help leverage the impact of their work.

The award citation notes that over the past five years, Mullaney "has formulated and deployed a far-reaching, campus-wide culture of continuous improvement. With limited staff, her strategy for growth and expansion has been to 'teach others to fish,' through a succession of Lean Six-Sigma tools and techniques — a 'belting system' that recognizes successful projects and leaders that improve processes and impact the University's effectiveness and efficiency. Under Mullaney's leadership, about 70,000 hours of faculty and staff capacity have been restored."

Said **Bob McQuade,** vice president for human resources, "Carol has been instrumental in inspiring our employees to acquire Green Belt certification. She is a champion of continuous learning and through her sharing of innovative ideas, the entire campus community has been provided with an invaluable resource that has helped imbue the spirit of continuous improvement across the University."

Ribbon cutting for new Turbomachinery Laboratory

BY SUE LISTER, MEDIA RELATIONS

Nearly two years ago to the day of the ribbon cutting, the University announced a plan to build a $36 million turbomachinery research and testing laboratory at Ignition Park in South Bend.

On that day, June 25, 2014, the University and its project partners — the city of South Bend, Great Lakes Capital, the state of Indiana and Indiana Michigan Power — unveiled a vision for the new Notre Dame Turbomachinery Laboratory (NDTL), a high-powered research laboratory to analyze and advance the technology of gas turbine engines used for jet aircraft, power generation plants and the oil and gas industry.

On Tuesday, June 7, the 25,000-square-foot facility was officially opened with a ribbon cutting ceremony featuring University leaders and researchers along with community, state and private sector representatives. Researchers at the NDTL will study aerodynamics, thermodynamics and structural mechanics of parts of large rotating machines, with a focus on things such as vibration, stability, flow and efficiency.

"This facility gives our students and faculty a unique capability — we can work in a research and development space no one else works in," said Vice President for Research **Robert J. Bernhard.** "It will help us draw the best faculty and graduate students to Notre Dame while providing valuable data to our business partners about their technology and equipment."

The University had previously operated a smaller-scale turbomachinery facility on campus, where it employed about 10 people. The new lab has five times as much space with four test bays and room to grow, in terms of both space and partners. Leading the NDTL are **Joshua Cameron,** research assistant professor of aerospace and mechanical engineering and director of the new laboratory, and **Scott Morris,** professor of aerospace and mechanical engineering and the lab's research director. The lab currently employs 37 people and will eventually employ about 60.

General Electric Corp., the original launch sponsor, is preparing to start a project in one of the lab's test bays, and Notre Dame expects the other bays to be busy with collaborations with a diverse set of turbomachinery industry partners. Through its previous work, the turbomachinery researchers have developed relationships with sponsors and collaborators including Pratt & Whitney, Rolls Royce, Honeywell, Siemens, ANSYS, NASA and the Air Force Research Lab, and recently have held exploratory conversations with these partners about expanding into the new NDTL.

The University also announced during the ceremony that it has signed a Center of Excellence agreement with Pratt & Whitney, a United Technologies Corp. company.

"We are very excited about the addition of Notre Dame as one of our University Centers of Excellence. Pratt & Whitney is committed to differentiating our products through investment in fundamental research and development of new technologies. Notre Dame has outstanding technical capabilities that complement our research needs," said Chris Kmetz, vice president and chief engineer, Systems Design and Component Integration, Pratt & Whitney, and a 1991 graduate of Notre Dame. "This relationship also allows us to bring our expertise to the next generation of engineers in a way that complements their traditional studies."

PHOTOS: MATT CASHORE

The University's new Turbomachinery Laboratory will advance the technology of gas turbine engines. Above, Notre Dame's Vice President for Research Robert J. Bernhard cuts the ribbon at the ceremonial opening.

OIT contributes bikes to Boys and Girls Club

PHOTOS: MATT CASHORE

While on a work retreat this summer, 260 OIT staffers assembled 30 bikes, which were donated to the St. Joseph County Boys and Girls Club. The division was looking for an activity that encouraged teamwork, and also allowed them to give back to the community. Sixteen boys and girls received bikes at the event. Center, Lenette Votava, marketing and communications professional for OIT, helps a child learn to ride her bike.

SERVICE ANNIVERSARIES

The University congratulates those employees celebrating significant service anniversaries in **July:**

35 Years

Michael J. Adamek, Custodial Services
Michael O. Garvey, Media Relations
Susan C. Steibe-Pasalich, University Counseling Center

30 Years

Roxanne J. Brock, Accounting Operations
Steven L. Ellis, Infrastructure Services
George E. Foree, Central Receiving
Phillip A. Johnson, Security
Anita L. Jones, Development
Kristine L. Mitchell, Civil and Environmental Engineering and Earth Sciences
Wolfgang Porod, Electrical Engineering
Lora J. Spaulding, Registrar

25 Years

Michael W. Bean, Sports Medicine
Nancy M. Beitler, Campus Ministry
Julia V. Douthwaite, Romance Languages and Literatures
Todd T. Hill, Food Services Support Facility
Maureen Metcalf, Chemical and Biomolecular Engineering
Michael R. Ridenour, Investment Office
Kimberely S. Ruiz, Food Services, North Dining Hall
Bradley D. Smith, Chemistry and Biochemistry

20 Years

Jamery S. Barry, Development
Carl R. Buchanon, Food Services Support Facility
Cindy S. Ciesiolka, Bookstore
Jeremy B. Fein, Civil and Environmental Engineering and Earth Sciences
Eileen L. Gieselman, Development
Mark E. Hogue, Infrastructure Services
Gloria A. Krull, Law School
Ursula I. Snyder, Custodial Services

15 Years

Jennifer S. Belovsky, Biological Sciences
Jose R. Cortes, Char-anna Koblick and **Khadija Oudghiri,** Food Services, South Dining Hall
Stephen D. Dumont, Philosophy
Patrick J. Flynn, Computer Science and Engineering
Matthew J. Gursky, Mathematics
Beth A. Hunter, Athletics Facilities and Sports Operations
Eric S. Mauch, Infrastructure Services
Gerald P. McKenny, Theology
Leo H. McWilliams, College of Engineering
Darrell R. Paulsen, Development
James D. Philpott, Political Science
Jason M. Schroeder, Office of the Controller
Paul J. Slaggert, Executive Education
Julia A. Thomas, History
Matthew C. Zyniewicz, College of Arts and Letters

10 Years

Richard J. Buhrman and **Brian R. Wrona,** Investment Office
Thomas R. Bullock, Accountancy
Julie A. Burnett, Development
Ryan K. Clark, Alliance for Catholic Education
Denise M. DellaRossa, German and Russian Languages and Literatures
Giles E. Duffield, Biological Sciences
Wendy W. Durham, Executive Education
Edmund P. Edmonds, Law Library
Marianne E. Gallimore, Food Services, South Dining Hall
Benjamin Jacobson, Campus Technology Services
Richard A. Jacobs, Legends
Robert M. Kelly, Athletics Ticketing
Elizabeth Kovacs, Electrical Engineering
James Leady, Finance
ChongKeat Arthur Lim, Mathematics
Jennifer M. McAward, Law School
Peter M. McCormick, Campus Ministry
Constance J. Morrow, University Health Services
Mark Noll, History
Bonnie Prestin, Civil and Environmental Engineering and Earth Sciences
Cindy Rice, Mail Distribution
Brandon E. Roach, Office of General Counsel
Kathleen M. Star, Office of the Controller
Yongtao Zhang, Applied Computational Mathematics and Statistics

NEW EMPLOYEES

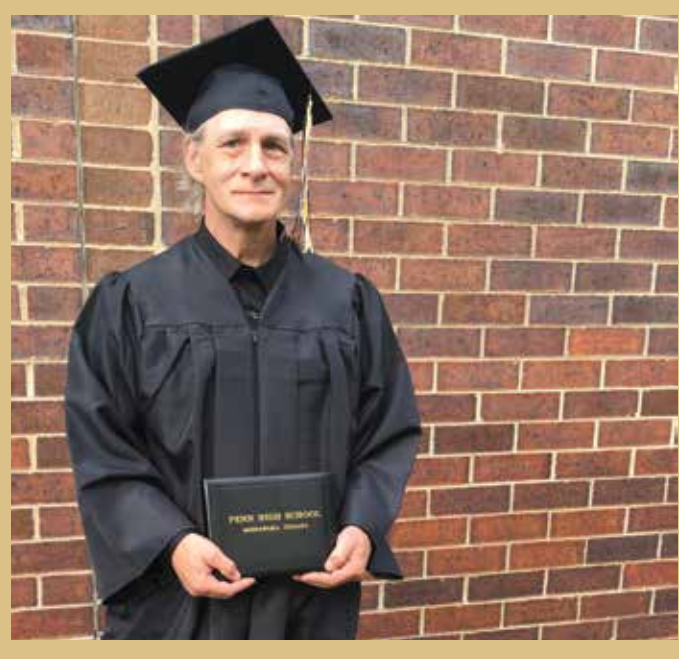
The University welcomes the following employees who began work in **May:**

Kevin W. Burke, Finance
Jeffrey L. Burris, Football
Diane B. Choi and **Ishaan Dixit,** Biological Sciences
Paul B. Como, Food Services, North Dining Hall
Tammi J. Freehling, College of Science
Luis R. Gomez Resendiz and **Valerie J. Jasper,** OIT
Tina Graham, Legends
Brittany D. Hammons, Julie C. Hentig and **Haley A. Sult,** Morris Inn
Justin M. Hickey, Recreational Sports
Diana S. Jeffrey, Custodial Services
Sarah Kasten, Hesburgh Libraries
Riley P. Koval, Annual Giving Programs
Jessica I. Kozlowski, Alliance for Catholic Education
Michael C. Macaluso, Institute for Educational Initiatives
Lisa A. Matejka, Center for Social Concerns
Deanna M. Menke, Theology
Mary C. Murphy, Development
Dawn Rizek, Graduate School
Shannon E. Rooney, Recruitment and Communications
Logan J. Schuetz, Athletics Ticketing
Tiffanie S. Stewart, NDnano
Dania Maria V. Straughan, Kroc Institute
Patrick W. Thomas, Clinical Law Center
Abel Torres, St. Michael's Laundry
Christine S. Wallace, Special Events and Stewardship
Elizabeth Willows, ND Environmental Change Initiative

IN MEMORY

The University extends sympathy to the families and friends of these recently deceased employees and retirees:

Conrad Kellenberg (Retiree, Law School) April 8
Daniel Ferry (Retiree) April 10
Lucille Wroblewski (Retiree, Library) May 3
Cecilia Klosowski (Term-vested employee) May 4
Stanley Farmann (Retiree, Library) May 13
John G. Beverly (Retiree, Accounting Faculty) May 19
Betty Ann Snyder (Retiree, Food Services) May 27
William Klein (Retiree) June 10
Mary Stanfield (Retiree) June 12



CHARU PANT

CONGRATULATIONS MIKE CORA

Mike Cora, Food Services cook assistant in the South Dining Hall, graduated with his diploma from Penn High School this June, at age 52. He's been taking classes off and on for the last six years. "I work two jobs, so things come up," he says.

In addition to his family, the ceremony was attended by Executive Chef Charu Pant, Mark Poklinkowski, South Dining Hall general manager, and Scott Kachmarek, Food Services director of student dining and restaurants.

Butterfly garden installed near St. Mary's Lake

Project is a gift from Class of 1976

BY DANA BAKIRTJY

During Reunion 2016, the Class of 1976 installed a butterfly garden of native plants at the corner of St. Mary's Road and Holy Cross Drive as their class gift. Situated near the Grotto, the garden will help promote pollinators on campus and provide a welcome pop of color for visitors and campus community members alike.

Because butterflies are naturally attracted to brightly colored, fragrant flowers, Notre Dame's garden features several colorful species including purple coneflowers, *Coreopsis verticillata* "Moonbeam," "Sunshine Blue" *Caryopteris incana*, and "Blue Chip" butterfly bushes (*Buddleia davidii*).

In addition to butterflies, the garden will likely attract other pollinators such as moths, flies, beetles and honey bees — pollinator numbers have decreased over the past several decades due to factors such as exposure to pathogens, parasites and pesticides as well as climate change and habitat fragmentation and loss.

In addition to the butterfly garden, native-plant landscaping around the Compton Family Ice Arena provides a microhabitat on the south side of campus that encourages wildlife and pollination.

The rain garden next to Stinson-Remick helps to control storm water run-off by providing a suitable environment for water to slowly percolate back into the ground; a green roof on top of the Morris Inn provides insulation, absorbs rainwater and helps reduce the discharge of pollutants into St. Mary's Lake.

"We welcome the addition of the butterfly garden to campus and are very grateful to the Class of 1976 for choosing to give back to the University in a way that promotes sustainability," says **Linda Kurtos**, director of sustainability. "The butterfly garden is a beautiful addition to Notre Dame's campus and we look forward to seeing it develop in years to come."

BARBARA JOHNSTON

During Reunion 2016, Dolly Duffy (at left) Alumni Association associate vice president for University Relations, helps members of the class of 1976 plant a butterfly garden on the edge of St. Mary's Lake near the Grotto.

from the
NOTRE DAME WELLNESS CENTER

Metabolic Syndrome

A Q&A with Chronic Condition Manager Maureen Jamieson

NOTRE DAME WELLNESS CENTER

Q: What is metabolic syndrome?
A: Metabolic syndrome is the term that describes a condition which is a cluster of abnormal traits or risk factors that are related to the body's metabolism, or how the body converts food into fuel.

Q: Is Metabolic Syndrome serious?
Metabolic syndrome is very serious and quite prevalent. Over one-third of adults have metabolic syndrome; if you are 60 or over, you have a 50/50 chance of having the condition. Think of metabolic syndrome as already being on the road to heart disease, stroke and diabetes. The good news is, there are signposts on that road that are pointing you toward the exit, and if you follow them, you can change your course. Metabolic syndrome is often entirely reversible with lifestyle changes.

Q: What can I do?
A: Make an appointment with your doctor or health care provider to be tested. Metabolic syndrome is a whole-body condition, so it is important to take the proper holistic approach involving dietary changes and exercise.

Q: How do they test for metabolic syndrome?
A: There are five main determining factors that are used to make a diagnosis of metabolic syndrome. They are:

1. **Abdominal obesity** (40-inch waist measurement or over for men, 35-inch or over for women)
2. **High blood pressure –** 130/85 or higher
3. **High fasting glucose levels in the blood –** 100 mg/dL or higher
4. **Low HDL cholesterol (or, good cholesterol) –** 40 mg/dL or lower
5. **High triglyceride levels in the blood –** 150 mg/dL or higher

Any one of these factors alone would be considered unhealthy, but an abnormal level for three or more of the five will result in a diagnosis of metabolic syndrome.

Q: What are the dangers of ignoring metabolic syndrome risk factors?
A: It is a fact, that if you have metabolic syndrome, you are two times more likely to die from a heart attack or stroke. You are three times more likely to suffer a heart attack or stroke and five times more likely to develop type 2 diabetes. Additionally, the odds that you will develop cancer, non-alcoholic fatty liver disease, cognitive dysfunction, depression and osteoarthritis are increased as well.

Q: What types of dietary changes are necessary to combat metabolic syndrome?
A: The foods that contribute to metabolic syndrome are the ones most closely associated with the modern diet. These are processed foods, most likely developed in a laboratory and designed to be addictive. They almost always contain high-fructose corn syrup.

Think about going back to basics and basing your diet on simple foods like vegetables and low sugar fruits. Select whole grains such as whole-wheat breads and pastas, brown rice and oatmeal, as well as starchy vegetables like potatoes, corn and yams and legumes such as peas and lentils, or black, pinto and garbanzo beans. Also recommended are lean, calcium-rich foods such as nonfat dairy milk, nonfat yogurt and soymilk, and fish, which is rich in omega-3 fatty acids.

Q: What about exercise?
A: Modern lifestyles have resulted in people becoming more sedentary. Many of us spend our days sitting at our computers, and our nights in front of the television. In reality, our bodies evolved to be in motion. Our ancestors spent their days walking about, hunting and scavenging for food and even running from predators. While we don't have to replicate this activity exactly, we do need to make sure we get out of the easy chair and get ourselves in motion. Thirty minutes of moderate exercise (a brisk walk a day) can significantly decrease your chances for developing metabolic syndrome.

Q: Where can I learn more?
A: More information can be found at **heart.org/HEARTORG, > Conditions > Metabolic Syndrome.**

PHOTOS: CAROL C. BRADLEY

Maureen Jamieson
Chronic Condition Manager
Registered Nurse/Dietician
Notre Dame Wellness Center

Cindy Borders
Certified Wellness Coach
Fitness Instructor and yoga teacher
Notre Dame Wellness Center

The Notre Dame Wellness Center's Wellness Coaching and Condition Management programs can help you reach your wellness goals. Programs are convenient, confidential and free for full-time benefit-eligible faculty and staff and their dependents, and dependents of graduate students.

FAMILY CONNECTIONS

This month NDWorks introduces a series of stories focusing on campus family connections — those with multiple family members working on campus or with other Notre Dame connections. This is the first of a series.

UNIVERSITY ARCHIVES

Catherine McGraw's grandfather Lewis McGann transported Knute Rockne to games during most of the 1929 season when the coach was laid up with phlebitis in his leg. The McGann name is just visible on the door.

Catherine DeFauw, Chas Grundy and Dave Grundy

Catherine DeFauw, an administrative assistant in philosophy, has worked on campus 24 years this July, and will be retiring in August.

Her family has long-standing Notre Dame ties. Paternal grandfather Neil Vincent Robertson, graduated from Notre Dame Law School in 1916.

Maternal grandfather Lewis W. McGann grew up in Macomb, Illinois, and studied at Western Illinois University, then a state teacher's college. At Notre Dame, he taught in the Minim Department, the grammar school for children age 12 and under.

Two of the minims, brothers William and Lawrence McIlwee (listed in the 1912 student index as ages 10 and 12) had a sister in Denver. "He saw her picture, met and married her," DeFauw says.

McGann bought the University's mortuary in 1911 — and McGann Funeral Homes are still a family-owned business today. The McGann ambulance transported Knute Rockne to games when, suffering from thrombophlebitis, he coached most of the 1929 football season from the sidelines in a wheelchair.

After Rockne's untimely death in 1931, his body was returned to South Bend and transported to McGann's funeral home. Rockne's was probably the largest funeral in the history of both McGann's and South Bend — the Studebaker Company loaned 22 limousines for the procession to the Basilica and burial in Highland Cemetery.

Today McGann Funeral Homes are owned by Catherine DeFauw's first cousin J. Patrick McGann — his wife **Tessa McGann** works in OIT with the campus workstation program.

DeFauw also has more closely related family working on campus. Son **Dave Grundy,** a Ball State graduate, joined the University a little over two years ago as digital media program manager for the Mendoza College of Business.

Chas Grundy '03 is the manager of product services for OIT and has worked at the University for 10 years. His wife, Amber Holleman Grundy, is a triple Domer ('02, '05, '07) with a Ph.D. in psychology. Amber is executive director of Camp Tannadoonah, a Camp Fire camp in Vandalia, Michigan; the family lives there in the summer, including children Avery (6) and Elyse (4).

CAROL C. BRADLEY

From left, Dave Grundy, Catherine DeFauw and Chas Grundy.

A third brother, Brian Grundy '05, is married to Katie Monahan '07 — they have two children, Samantha and Jasper.

And of course all the grandchildren, Chas Grundy notes, "are future Domers."

The Notre Dame & Western

Modest rail line meant mighty connection to world beyond campus

BY JOSH STOWE, FOR NDWORKS

Long before Notre Dame became a globally recognized university, the campus benefited from a small rail line that helped give it access to the outside world: the Notre Dame & Western Railroad.

The short stretch of track — built just decades after Father Sorin founded the University — helped transport coal that powered campus, delivered additional supplies and carried passengers eager to see the Fighting Irish play.

"I think it was about access to the outside world and getting access to outside goods," says **Paul Kempf,** senior director of utilities and maintenance. "This really became a way to get materiel here. It became the lifeline to the greater United States, because in those days you could ship whatever you wanted by rail."

At its peak, the line, which stretched about a mile and half, connected to Michigan Central tracks that crossed Saint Mary's College to the west, running north into nearby Niles, Michigan, and south into downtown South Bend. From there, goods and passengers could reach Chicago and or the East Coast.

The first tracks on campus were built in 1882 to haul ice cut from St. Joseph's Lake. Twenty years later, under the leadership of Rev. John Zahm, C.S.C., Notre Dame's vice president, the tracks were extended, allowing the University to more efficiently haul the coal it needed to burn for power.

Brother Borromeo Malley, the longtime director of campus utilities who oversaw the line for more than 40 years, later christened it the Notre Dame & Western Railroad. In the years following World War II, Notre Dame acquired a war surplus diesel-electric locomotive, several hopper cars, and a locomotive crane — the first car to carry the line's new name.

Between 1935 and 1962, trains carried passengers as well as coal. The arrangement allowed alumni clubs to charter special runs to bring fans to games. It meant fans from Chicago could travel to campus without having to stop in downtown South Bend and hail taxis. Over the years, special game weekend excursions also took fans to away games against opponents that included Ohio State, Michigan State and Purdue.

As late as the 1990s, long after the passenger runs had ceased, the line provided an easy way for Notre Dame to continue hauling coal to the power plant. More recently, the University has used trucks to bring in coal. In 2015, Notre Dame announced plans to cease burning coal within five years as it focuses on reducing its carbon footprint.

But for much of the 20th century, the Notre Dame & Western Railroad was a special connection to the outside world — one the *Scholastic* anticipated in its coverage of the newly laid tracks in November 1902:

"As soon as cars are running on the new track Notre Dame will have complete and thorough communication with all parts of the world," Frank J. Barry wrote in the magazine. "At present a student may speak by telephone with friends in any part of the United States, and he may send a telegram flying to the ends of the earth. By the building of this railroad, the University has opened another means of communication, so that Notre Dame now has all the facilities of the best equipped cities in the land."

RICHARD STEVENS

Archival photos of the Notre Dame & Western locomotive (at left) in 1969 and at the station, circa 1929. Photos courtesy Elizabeth Hogan, University Archives.

Behind the Scenes: Powering Campus

A department they hope you don't think about

BY JOSH STOWE, FOR NDWORKS

Paul Kempf leads a team that keeps campus running smoothly, but he hopes you've never given them a second thought.

Kempf, the senior director of utilities and maintenance, oversees a crew of about 100 that runs Notre Dame's power plant, keeps electricity and water flowing, and maintains campus facilities.

"I tell my employees our job is to make sure no one notices us," Kempf says. "You get noticed when something goes wrong."

Under his leadership, the department is helping the University work toward an ambitious goal of delivering sustainable energy.

Notre Dame plans to reduce its carbon output per square foot by 83 percent by 2050, and Kempf's team has led the way with a series of initiatives — just the latest challenge he's tackled in his current role.

"Energy is — if not the most — probably one of the most important aspects of sustainability," Kempf says. "And when you look at what you can do to be more sustainable, there is a wide range of things we can do that have a variety of costs and benefits. We wanted to start with all the easy things that will make a sustainability impact and save money, and then work our way up to the bigger things."

It began with simple energy conservation improvements like changing to more energy-efficient light bulbs. Now the department is beginning to use building analytics to monitor and manage energy usage. They've studied how HVAC, wastewater and storm water can be managed more efficiently, and continue to look at ways to enhance fuel diversity, so the University isn't overly dependent on any one energy source.

"Over an eight-year period, we've reduced baseline energy use by 15 percent," Kempf says. "If you look at energy use over time, it's just been a curve that continues to grow. We've literally flattened out the University's energy curve, even though campus itself has continued to grow. We were early adopters compared to a lot of our peers."

Kempf enjoys helping his team contribute to Notre Dame from behind the scenes. His department is responsible for building redundancy into systems to make sure they run reliably, even as it takes on innovations such as leading sustainability initiatives on a growing campus — all of which are necessary for the University's ongoing commitment to excellence in education and research.

In addition to steam, the power plant produces nearly half of the electricity the University uses. Other ancillary products include compressed air and drinking water. The department also manages both storm and sanitary sewers.

"It's been interesting thinking about it as people retire, how many buildings have been built since they started working here. It creeps up on you. You wonder what it will be like 50 years from now.

"In the last decade or so, there's been a real focus on how to drive the University's reputation, how to spread the message," Kempf says. "We're starting to see how the University has an impact that is much broader than we ever anticipated."

MATT CASHORE

Kempf

University leading the way in sustainable energy

"We're at early design stages of a series of projects that will reduce our carbon footprint and increase energy capacity to support significant present and planned future growth of campus,"says Kempf.

Gas turbine technology — The University will install combined cycle combustion gas turbines to produce both electricity and steam. These units will displace older power plant boilers with newer, higher efficiency and lower emissions sources of energy.

Geothermal applications — Projects are currently underway to install geothermal systems beneath the East Quad, south campus and on the northeast edge of campus near Stepan Center.

The East Quad project, Kempf says, "All the wells have been drilled, and piping has been run to Pasquerilla Center and the Ricci Band Building. The east campus project has a 300-ton capacity—the equivalent of 3.6 million BTUs of heating or cooling energy. This summer we're working at installing the mechanical systems in Pasquerilla and the Ricci Band Building that will connect with the well field. The system, which for now will serve only those two buildings, will be operational for winter 2016-17."

The South Campus geothermal well field, located in the parking lot north and east of Legends, "is intended to serve initially the development of the new School of Architecture and any additional new buildings on the south side of campus."

In this project, he adds, "We'll be connecting the geothermal system to our central chilled water system so that in the cooling seasons the energy can be used wherever it is needed. During the heating seasons the energy will be distributed locally to buildings in that region of campus." The well field is expected to generate 12 million BTUs per year.

A third project will start in August at the future Ricci Fields, three recreational and band practice fields north of Stepan Center, just west of the Stinson Rugby field.

"We're putting a geothermal well field underneath those fields," Kempf says. "That system has a capacity to produce 16 million BTU's of energy. Collectively these projects will contribute a significant amount of energy at a lower carbon intensity than traditional energy systems, they will increase the percentage of our energy portfolio that comes from sustainable means."

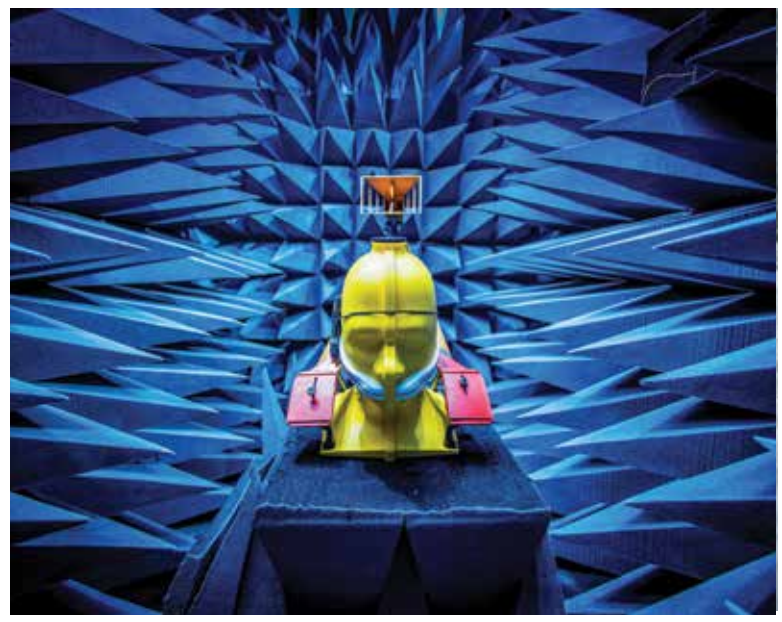
Hydro power — The University is currently working with the city of South Bend and state and federal agencies to construct a hydroelectric facility on the St. Joseph River dam in downtown South Bend, near Century Center.

The facility is expected to produce 7 percent of current campus electrical needs. The University hopes to start construction in 2017, with the goal of generating electricity starting in 2019.

All the projects, he notes, support the University's aspirational goal of reducing our carbon footprint (on a growth-square-foot adjusted basis) by 50 percent by 2030 and by 83 percent by 2050, based on a 2005 baseline.

MATT CASHORE
University Photographer of the Year

University Photographers' Association of America (UPAA) has named University photographer **Matt Cashore** 2016 Photographer of the Year. The award is decided by a combination of a monthly online contest and a year-end print contest. To view (or purchase prints) of one of Cashore's many photos of Notre Dame sports and the campus, visit **photos.nd.edu.** For a story on Cashore's techniques for shooting football games, visit **upaa.org/content/matt-cashores-shoelace-remote.**



Program gives tips for bringing great ideas to life

"People treat creativity almost like a religion," says David Burkus, keynote speaker at the inaugural ND Showcase. However, Burkus has identified scientific principles for understanding the creative process and the social environment that helps creativity and innovation thrive.

MATT CASHORE

CIDNI SANDERS, INTERNAL COMMUNICATIONS

Even the greatest ideas won't thrive in an unsupportive environment, so a new University program is focused on helping team members be more receptive to creativity and innovation.

Most times when a new solution or approach is proposed, the tendency is to automatically respond with a "yes" or "no." But there's another option, according to David Burkus, a best-selling author, award-winning podcaster and management professor.

"Whether you're in a leadership role or as a peer, when someone presents to you a great idea, ask 'What would have to be true for this idea to work?'" he said. "Why do you ask that? One, it shows an acceptance of the idea," he said, "but it also challenges the ideator to help you figure out how to get information, how to test it, how to get data on whether it will or will not work."

Burkus was the keynote speaker at ND Showcase, an event held in June to help staff members across the University not only initiate transformational change efforts, but also see them succeed. He said that gathering data and evaluating a proposal early in the process helps support the creative process because teams can then make decisions based on objective factors rather than rely on past experiences or assumptions.

"We don't actually need more ideas. We need to get better at sharing and recognizing and celebrating the great ideas that we already have," Burkus said.

John Affleck-Graves, the University's executive vice president, sponsored ND Showcase as part of Human Resources' Building Leadership Excellence speaker series. The program was piloted this summer to about 150 supervisors and Continuous Improvement graduates; however, in the coming months, the principles and resources highlighted during the event will be further shared with a variety of teams.

"Through ND Showcase, we hope to build a network that will explore best practices, learn from each other's successes and setbacks, and ultimately cultivate solutions that will benefit our campus for years to come," said Affleck-Graves. "We've already seen some promising results from staff who have worked together in new ways to bring good ideas forward. As we expand our capabilities in supporting creativity and innovation, we will expand the areas in which we can achieve success."

In addition to the keynote speaker, the ND Showcase event included three University teams who have used new approaches to create breakthrough results. The teams discussed some of the tactics that helped make their projects successful.

The Athletics, Ticketing & Technology team said they received invaluable input when they reached out to Mendoza College of Business students for help with a project. The students brought a fresh perspective to the problem the team was trying to solve, and the department was able to implement some of their suggestions. Another team responsible for a multi-year effort to manage student files online emphasized the importance of having a champion in a leadership position and devoting adequate resources to ensure the project's success.

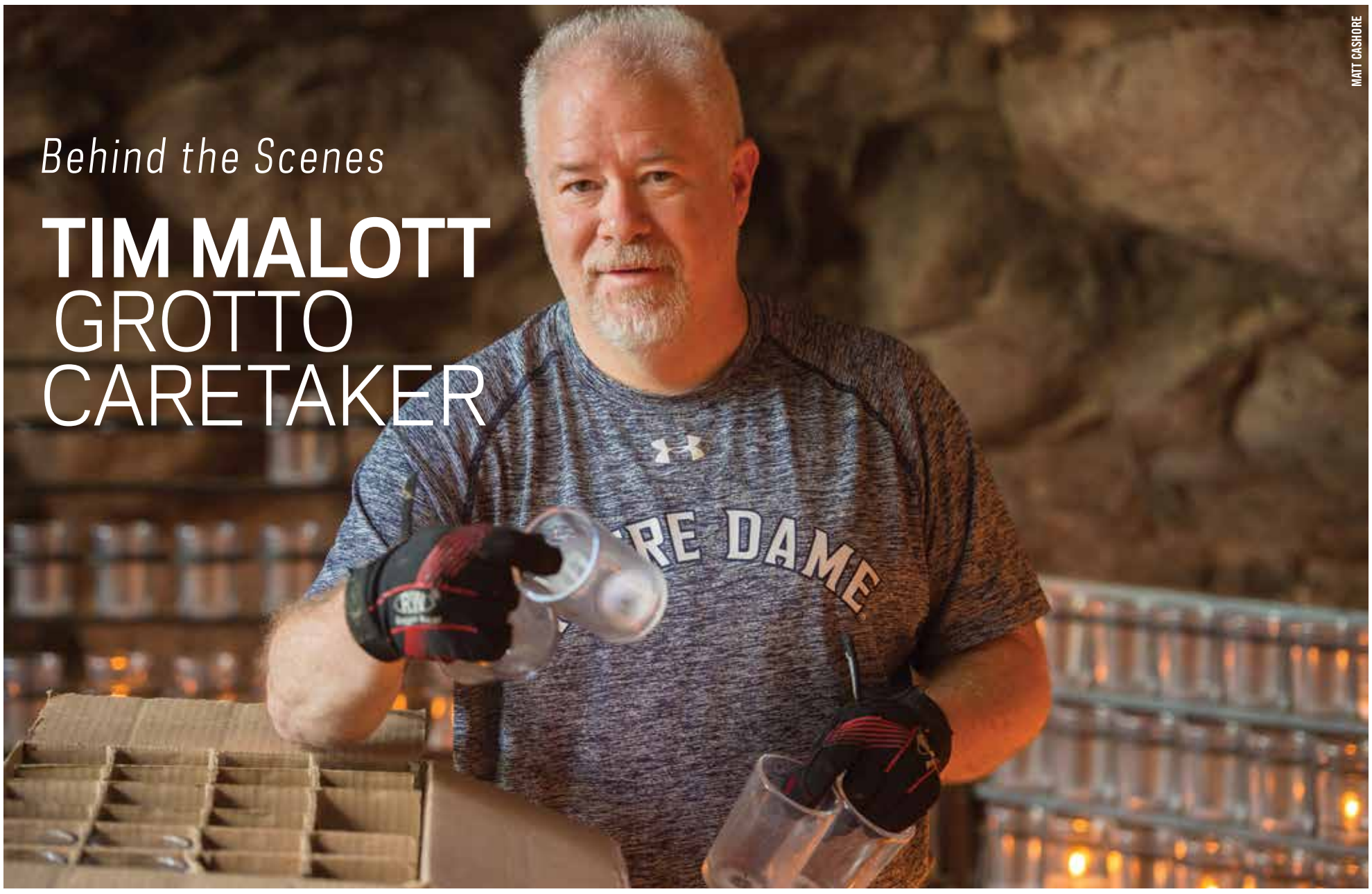
Staff from the Office of Continuous Improvement also shared three new opportunities they make available to departments looking to quickly implement process improvements and launch change efforts. Move-It! is a 90-minute activity during which participants build on each other's ideas. Kaizen workshops are one- to three-day events that provide intense focus on a particular area. And Yellow Belt projects provide a structured team approach to implement change.

While Continuous Improvement still offers Green Belt and Black Belt training for solving complex projects, the new training helps individuals and teams get things done faster.

Burkus noted that the University is on the right track in fostering creativity and innovation. He encouraged the ND Showcase attendees to continue thinking of ways to lessen resistance to change and increase support for new thinking.

"The social environment that someone is in determines the frequency that they'll have creative ideas," said Burkus. "Accepting limited risk-taking, creating a culture of safety so that we can take risks, encouraging the sharing of ideas – especially across departments – all of these things affect the social environment."

To learn more about how you can better support transformational change in your department, email **showcase@nd.edu** or visit **continuousimprovement.nd.edu.**



Behind the Scenes

TIM MALOTT GROTTO CARETAKER

BY CAROL C. BRADLEY, NDWORKS

Tim Malott has a full-time job working for a book manufacturer — HF Group in North Manchester, Indiana. But because his hours are flexible, he took a second job as caretaker of the Grotto.

"Because of my full-time job it can be stressful, but I know I'm serving people," he says. "I meet people from all over the world."

Recently, he notes, a group of four nuns visited — their first trip to campus. He took photos of them with their cameras. Another visitor he remembers is a lady who's attended every home football game since 1969. "One of her stops is the Grotto," he says.

When he first started in the position (which is under Campus Ministry) he worked seven days a week. Another caretaker, **Richard Albright,** was hired, so now he works from 6 a.m. to 8 a.m. on Monday and Tuesday, and starts at 7 a.m. on weekends. Football Saturdays he's on campus from dawn to kickoff, which can be late when it's a night game.

For last year's USC game, he notes, he was taking care of the Grotto and stocking candles for 14 hours — during which time he saw four marriage proposals. He sees them pretty often, he adds, but not normally so many in a day.

The job is rewarding, "Very spiritual for me," Malott says. He often takes photos of campus in the early morning. "In winter, the light is so eerie," he says. He bought a Nikon camera on the recommendation of University photographer Matt Cashore, but often shoots using his cellphone. "I still have a lot to learn. But if I see something 'Wow!' I shoot it."

Malott's photos of the Basilica, at left, and below, a long line of visitors to the Grotto on the first football Saturday of the year.