Pathfinders
Driving the Art of Intellectual Discovery
Bradley University has a national reputation for providing students with transformative learning opportunities in and outside of the classroom. As a mid-sized university making an impact in a variety of research arenas, we take immense pride in the spirit of collaboration practiced daily across all academic units. Our dynamic faculty are leaders, mentors, and collaborators, recognized for their excellence in teaching and dedication to student achievement.

In this issue of Bradley Works, we spotlight several of our faculty members’ recent professional pursuits, which speak to the level of scholarship, research, innovation, and creativity that takes place every day on our campus. These are just a sampling of the myriad opportunities for discovery and growth occurring in our five academic colleges and The Graduate School:

- **Foster College of Business:** Professionals in our Executive MBA program are gaining vital insights and skills for improving their workplace cultures by learning from a professor who has studied the best practices at a wide range of notable organizations. Her latest book is a guide for employers seeking to build trust and camaraderie within their companies.

- **Slane College of Communications and Fine Arts:** A professor in the art department has received worldwide accolades for a unique photography collection of female hunters titled *The Modern Day Diana*.

- **College of Education and Health Sciences:** Students and a professor in Bradley's Doctorate of Physical Therapy program studied angular velocity to determine the safest, most effective techniques for use in the workout regimen known as “tire flipping.” They used video and motion analysis software to complete their work.

- **Caterpillar College of Engineering and Technology:** An electrical and computer engineering professor who has survived cancer is researching methods of improving the resolution of ultrasound images to increase doctors’ diagnostic capabilities.

- **College of Liberal Arts and Sciences:**

  Student researchers collaborating with a biology professor on stem cell research recently played a role in two significant contributions to the field of regenerative medicine. Other research from the college you will read about includes a search for ways to identify preschool-age children at risk for attention deficit hyperactivity disorder, a look into adolescents with ADHD who may be especially vulnerable to substance abuse, and the collaboration between a psychology professor and undergraduate researchers at our new Stress, Emotion, and Alcohol Laboratory.

  The Robert and Carolyn Turner School of Entrepreneurship and Innovation — the first of its kind in the nation established as a stand-alone academic unit — opened in fall 2012 and offers students from all disciplines the tools they need to become tomorrow’s savvy business leaders.

  Students from our business college and our engineering college now work together with faculty mentors on convergence projects to solve real-world problems for diverse clients. In the process, they enhance the depth of their knowledge, hone their leadership skills, and gain experiential opportunities employers value.

  Our University prides itself on the intelligent, innovative men and women who propel discovery while instilling a passion for learning in their students. Together, they inspire the world and further Bradley’s commitment to producing the next generation of gifted leaders and entrepreneurs.

Warm regards,

[Signature]
Bradley Works, a publication of Bradley University, highlights the research, collaboration, and creativity of Bradley faculty and students.

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Our Mission
Inspired by founder Lydia Moss Bradley’s commitment to useful learning and ethics, Bradley University educates leaders, innovators, and contributors to the well-being of all humanity.

NOTEWORTHY
02 Speech Team Best in Nation
03 Ray LaHood Honored
04 Commemorating the Civil Rights Movement
05 Historian and Abolitionist Scholar Featured on National TV
06 A World-Class Gold Chapter
07 Grants and External Funding
08 The Robert and Carolyn Turner School of Entrepreneurship and Innovation

FEATURES
10 Building a Better Workplace
12 Contemporary Neuroscience and Addiction
14 The Future of Regenerative Medicine Is Now
18 Advances in Enhanced Imaging
20 Early Diagnosis Key to ADHD Intervention
22 Athletes Flip for Motion Analysis
24 Bonding Across Disciplines: Business and Engineering
28 Hunting for the Shot
32 Researching the Behavioral Effects of Alcohol Use
34 FIRST PERSON Poetry’s Afterlife and the Aesthetic Hereafter

IN PRINT
36 Publications and creative productions of Bradley University faculty

COVER: Among the exemplary Bradley faculty included in this issue are: (1) Dr. Craig Cady, associate professor of biology; (2) Dr. Jennifer Robin, assistant professor of management and leadership; (3) Dr. José Sánchez, assistant professor of electrical and computer engineering; (4) Joe Kelly, assistant professor of physical therapy and health science; (5) Margaret LeJeune, assistant professor of photography; (6) Dr. Timothy Koeltzow, associate professor of psychology; (7) Dr. Darrell Radson (left), dean of the Foster College of Business, and Dr. Lex Akers (right), dean of the Caterpillar College of Engineering and Technology; and (8) Dr. Kevin Stein, Caterpillar Professor of English at Bradley and Illinois Poet Laureate.
Speech Team Best in Nation

Bradley University’s speech team claimed its 40th and 41st national championships since 1978 after winning both the National Forensics Association (NFA) and the American Forensics Association (AFA) tournaments last spring. It was the second consecutive year the most successful speech team in the nation won both championships.

At the NFA tournament in Huntington, W.Va., junior Kaybee Brown was crowned the individual sweepstakes champion. At the AFA tournament in Hutchison, Kan., senior Jacoby Cochran was named individual champion.

Bradley Ranks Among Top Universities

Bradley was recognized as a top university in 2013 by U.S. News & World Report, The Princeton Review, and other publications and websites.

In America’s Best Colleges 2014, U.S. News & World Report ranked Bradley fifth among Midwest colleges and universities that provide a full range of undergraduate and graduate programs.

The report also ranked Bradley as seventh in the “Best Value” category, and the Caterpillar College of Engineering and Technology continued to receive national recognition as one of the best undergraduate engineering programs in the country.

Bradley was included in The Princeton Review’s The Best 378 Colleges. Only 15 percent of all four-year colleges in the U.S. receive this distinction. The publication praised Bradley’s extensive academic resources, personal attention to students and ideal class sizes.

The Princeton Review and Entrepreneur magazine also ranked Bradley’s undergraduate entrepreneurship program among the top 20 in the nation.

For the second consecutive year, The Princeton Review named the University one of the “Top Undergraduate Schools to Study Video Game Design.” Additionally,
Ray LaHood Honored

Former U.S. Secretary of Transportation Ray LaHood, HON ’11 has been named the first Honorary Senior Distinguished Fellow for the Institute for Principled Leadership in Public Service (IPL) at Bradley. Through his appointment, LaHood will participate in national public policy symposiums on Bradley’s campus and guest lecture in University classrooms.

LaHood is the first Bradley alumnus to serve in a presidential cabinet, a position he held from 2009 to his retirement in 2013. The first Republican in the Obama cabinet who served in elective office, he was a U.S. representative from Illinois from 1994 to 2008.

IPL promotes a return to statesmanship at all levels of government. Its goal is to become a Midwestern think tank advocating for a bipartisan leadership approach to resolve America’s most pressing problems.

Fulbright Recognition

The U.S. Department of State ranked Bradley sixth nationally among universities of its type for producing the most Fulbright students in 2013–14. Receiving Fulbrights were Julie Mohedano, Anna Treesara, and Nausheen Farishta, who are teaching English in Brazil, Thailand and Spain, respectively.

Eleven current Bradley faculty members have been named Fulbright Scholars, including Dr. Cecile Arquette, associate professor of teacher education. She is teaching English as a foreign language at the Pontifical Catholic University of Valparaiso in Chile in 2014.

The Fulbright Program is the U.S. government’s flagship international educational exchange program. Since its inception in 1946, the program has provided more than 325,000 participants with the opportunity to study, teach, conduct research, exchange ideas, and contribute to finding solutions to shared concerns.
Commemorating the Civil Rights Movement

Leaders who have worked for racial equality and women’s rights, and against human trafficking have been visiting Bradley’s campus during the 2013–14 academic year as the University pays tribute to the civil rights movement. Focused on the campus theme “Standing Together,” the yearlong celebration marks the impressive strides made 50 years ago with Dr. Martin Luther King Jr.’s powerful “I Have A Dream” speech, delivered in Washington, D.C., on August 28, 1963, and the passage of the landmark Civil Rights Act of 1964.

As people throughout the nation observe these milestones, Bradley is among the many looking to the past for inspiration to help shape the future. From the University’s beginning in 1897, it maintained an open admission policy that provided for men and women, regardless of age, race, ethnicity, religion, socioeconomic level or sexual orientation. At its very roots, founder Lydia Moss Bradley and her husband, Tobias, sought to live in a “free” state. Peoria was a natural choice. In 1854, Abraham Lincoln gave one of his first major public speeches against the extension of slavery in front of the Peoria County Courthouse.

Bradley’s observance featured a screening of To Kill A Mockingbird, a theater department production of Clybourne Park, a re-enactment of civil rights trials and more. In collaboration with Peoria Reads, students, faculty, and staff were encouraged to read Warriors Don’t Cry, a biography about the Little Rock Nine and the fight to desegregate Central High School in Little Rock, Ark., in 1957.

Dr. Terrence Roberts, who was among the African American students known as the Little Rock Nine, visited campus to share his experiences on the front lines of desegregation and discussed its impact on today’s society.

Other guest lecturers included Lilly Ledbetter, who fought for equal pay for women at Goodyear; Dr. Bernice Sandler, considered the “Godmother of Title IX,” who discussed how women are treated differently in unnoticed ways; and Janet Drake, senior assistant attorney general for the Colorado Department of Law, whose focus is raising awareness about human trafficking. A panel discussion about feminist Betty Friedan, HON ’91 and a lecture about civil rights leader Bayard Rustin also were held. The celebration will culminate in spring 2014 with an event featuring U.S. Rep. John Lewis, a member of King’s inner circle.

Trade Expert Earns International Award

Bradley University’s James Foley, left middle, received a Lifetime Achievement Award from the International Association of Trade Training Organizations. The honor recognizes his leadership and contributions to the industry.

Foley is director of operations at the Turner Center for Entrepreneurship. He coordinates a training and counseling program in international business planning, marketing, logistics, and export finance through the University’s International Trade Center. Working with the U.S. Small Business Administration and the Illinois Department of Commerce and Community Affairs, he assists companies with trade-related expansion and training.

Postcards from Home Recognized

Dr. Bob Jacobs, left bottom, professor of communication and director of Bradley’s John C. Hench Production Art Studios, received his sixth Telly Award last March for his Postcards from Home series. The Telly Awards are an annual international competition for professional video and television artists.

In 2012, Jacobs won a Communicator Award of Excellence for Postcards from Home, a weekly TV news feature aired on WCIA (CBS) in Champaign and Springfield, Ill. This is his 17th award.

Jacobs recently received a $100,000 gift from the John C. Hench Foundation for campus production studio upgrades.
Historian and Abolitionist Scholar Featured on National TV

When cable channel TLC needed an authority on the abolitionist movement for an episode of *Who Do You Think You Are?*, executives turned to Dr. Stacey Robertson, Bradley’s Oglesby Professor of American Heritage and interim dean for the College of Liberal Arts and Sciences. Robertson was among four experts on the August 13 episode of the series, which delved into the ancestry of actress and singer Zooey Deschanel.

Robertson met with Deschanel at Swarthmore College in Pennsylvania, where a variety of mid-19th century documents related to Deschanel’s ancestors are stored.

Robertson said, “It was an honor to conduct research for this program. With so many historians available, I feel fortunate to have been selected.”

Robertson has authored four books, including *Betsy Mix Cowles: Champion of Equality*, which was published in 2013.

Introducing at the Olympics

Eighteen Bradley students earned prestigious internships with NBC for the 2014 Winter Olympic Games in Sochi, Russia.

Six students traveled to Sochi to work at the Games, while the remaining 12 worked behind-the-scenes production jobs at the NBC Sports studios in Stamford, Conn.

This year marked the second time Bradley students interned for NBC’s Olympics coverage. Ten Bradley students interned with the broadcasting company during the 2012 Summer Olympic Games in London.

Dr. Paul Gullifor, the Henry Means Pindell Endowed Chair in Communication, said NBC not only hired more Bradley students for the Winter Games, but the network selected fewer interns overall for its production team. “I am thrilled 18 were selected,” he said. “Not only did our number of interns increase, our total share did, as well.”
A World-Class Gold Chapter

Bradley’s chapter of Beta Alpha Psi, the international honorary organization for financial information students and professionals, was named one of 12 Gold Chapters in the world last August. The award, based on accomplishments and activities throughout the year, was presented at the international organization’s annual meeting in Anaheim, Calif. The honor is the highest a chapter can earn and the fourth such award for Bradley in the last five years.

Chapter adviser Dr. Simon Petravick, chair of the accounting department, also received his second Outstanding Faculty Adviser Award.

After winning a regional competition earlier in the year to qualify, the Bradley group took part in the national finals of Beta Alpha Psi’s Best Practices competition. The students presented on chapter operations and participated in professional development events at the annual meeting. They joined 1,200 other financial information students for a community service day focused on literacy.

Beta Alpha Psi has more than 300 university and college chapters worldwide. Bradley’s chapter has about 30 students and is open to junior, senior, and graduate accounting majors who meet grade point requirements.

Autonomous Boat Cited for Technical Superiority

Electrical and computer engineering majors Steve Blass and Zack Knoll entered the 2013 International RoboBoat Competition in Virginia Beach, Va., with great anticipation. They had worked tirelessly on their senior capstone project: a battery-powered autonomous surface vehicle (ASV).

Blass programmed the basic shell or architecture that drove the main control device while Knoll focused on hardware fabrication and wrote substantial portions of the final software.

They were assisted by fellow electrical engineering majors Bradley Lan and Dan VanDeWater. The team tried to anticipate every potential problem and programmed the boat’s onboard computer with all the necessary fail-safe commands.

The competition included an obstacle course that, once successfully navigated, advanced a team to five difficult challenge stations. “Team Bradley was the only team to successfully compete in three of these challenges during the week,” said alumni Nick Schmidt, assistant lab director at Bradley.

The event’s criteria involved 13 factors, such as the boat must be buoyant for at least 30 minutes and cannot send or receive instruction while in the autonomous mode.

Bradley’s wood and plastic vehicle fared well in the qualifying run and appeared to be a strong contender. However, when a buoy drifted from its intended location and was undetected by the boat’s camera, the Bradley boat switched to challenge mode, headed for the correct GPS coordinate, and became stuck on a rope.

While Team Bradley lost, the competition’s judges were so impressed by the group’s technical achievement and high performance that they gave an unprecedented fifth-place award. Schmidt said, “They produced a technically sound boat at a fraction of the cost of some of the other teams from highly competitive schools.”
Grants and External Funding

During the fiscal year 2012–13, Bradley faculty and staff were awarded more than $2.9 million in grants and contracts from government agencies, nonprofit organizations, private foundations, corporate partners and other sources.

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Bradley Works 2014 7
With a plentitude of opportunities for aspiring young entrepreneurs, The Turner School of Entrepreneurship and Innovation opened in fall 2012 as the first such school established as a standalone academic unit in the nation. “The Turner School offers students a comprehensive toolbox on the path to success as entrepreneurs from opportunity recognition, to market feasibility, to business model development, to networking, to launch,” said alumnus Robert Turner, chairman of the Bradley University Board of Trustees who, with his wife, Carolyn, endowed the school.

Bradley’s entrepreneurship program was ranked among the top 20 undergraduate programs in the nation by The Princeton Review and Entrepreneur magazine, advancing four spots to the 19th position in 2013.

**Entrepreneurship Minor and E-Scholar Program**

The new minor and E-Scholar curricula were officially launched last fall and already have students enrolled from disciplines across the University with a majority being non-business majors. The minor is composed of five entrepreneurship courses while the E-Scholar program has three.

**Start-up Weekend**

Bradley students and community members participated in Peoria Start-up Weekend in November. More than 70 participants worked in teams to develop and pitch local tech startup ideas. Bradley students were members of all three winning teams. The first-place winner was a crowd- and social media-sourced application that will connect fans and bands with nearby venues.

**Brave Pitch Competition**

Bradley electrical engineering majors Anton Volkov and William Tarply won the 2013 fall semester Brave Pitch Competition in October. Their project, an HDMI box split with two video signals on a 3-D monitor, advanced them to compete in Chicago against students from other schools.

**Entrepreneurship Program Recognition**

Entrepreneurs are innovators, risk takers, and leaders, but they must also do their homework. Passion alone is not enough. Research is essential in the field of entrepreneurship as a relatively new area of academic study.

Dr. Gerry Hills, chair of the Turner School of Entrepreneurship, notes: “Bradley is unique in its ability to start a school of entrepreneurship and innovation. I think it’s a credit to Bradley – that collaborative nature. Everyone shared the vision that Dr. Gerry Hills put forward; the colleges embraced it, and Provost Glassman implemented it. We are just the catalysts.”

— Robert Turner ’77 MBA ’78, Chairman of the Board of Trustees

BY SUSAN ANDREWS

ABOVE: Dr. Gerald Hills, left, founding director of the Turner School of Entrepreneurship and Innovation, with Robert Turner ’77 MBA ’78 in Westlake Hall’s atrium.
Entrepreneurship and Innovation, co-authored an article titled “The Entrepreneurial Marketing Domain: A Citation and Co-Citation Analysis” in the *Journal of Research in Marketing and Entrepreneurship*, which was chosen as a Highly Commended Award Winner at the 2013 Literati Network Awards for Excellence. He and his colleagues were honored with the Distinguished Research Award at the Academy of Entrepreneurship 2013 Annual Conference for their quantitative study of business owners and perceived network benefits.

In addition, Dr. Eden Blair, professor of entrepreneurship, technology, and law; Ken Klotz, managing director of the Turner School of Entrepreneurship and Innovation; and Hills were recognized as Best Conference Workshop Finalists at the 2013 U.S. Association of Small Business and Entrepreneurship Annual Conference in San Francisco.

The Turner School Distinguished Entrepreneur Speaker Series

Redbox co-founder Mike DeLazzer was the fall 2013 Turner School Distinguished Entrepreneur Speaker, providing spirited engagement to an audience filled with young entrepreneurial hopefuls. Sharing his personal journey to the top, he suggested that students embrace hope and deny fear: “Hope creates amazing things in the world. It’s a passion that won’t give up no matter the obstacle. Fear is the lazy person who’s not doing anything with his life, stares at a goal, and does nothing about it. What matters is your ability to keep going no matter the obstacle.”

Other Turner School opportunities available to all Bradley students include the new Entrepreneur Intern Program, the Entrepreneur in Residence Program, Mentors on Call, and the spring semester Distinguished Entrepreneur Speaker event.

National Opportunities

Bradley served as a co-host of the annual Research Symposium on Marketing and Entrepreneurship along with Michigan State last August in Boston. More than 30 research presentations were given in conjunction with the American Marketing Association. Professors from 11 countries were in attendance.

The Turner School also served as the Executive Office for the National CEO Conference last November in Chicago with nearly 1,300 students and 100 faculty.
Building a Better Workplace

An outstanding benefits package may attract employees, but the most integral building blocks toward keeping them are trust, pride and camaraderie, said Dr. Jennifer Robin, assistant professor of management and leadership at Bradley.

Dr. Robin and co-author Dr. Michael Burchell interviewed CEOs, human resources directors, and managers at 10 workplaces for their latest book, *No Excuses: How You Can Turn Any Workplace into a Great One*.

The authors chose a variety of outstanding workplaces to show that no matter what size a company is or its mission, “everything is scalable,” Robin explained.

All 10 companies have appeared on national or international lists of great workplaces and represent an array of sizes and interests. Multinational Coca-Cola, nonprofit Teach for America, online shoe and clothing company Zappos, Alston & Bird law firm, Balfour Beatty construction company, Devon Energy, healthcare leader Mayo Clinic, Whole Foods Market, consulting firm Accenture, and computer storage and data management company NetApp round out the list of employers featured in the book.

A “can-do” guide for employers, the book was written in response to the authors’ first book, *The Great Workplace: How to Build It, How to Keep It, and Why It Matters*. “When we made presentations after our first book, managers would say it sounds good, but they can’t do it because they are too big, they are in the wrong industry, or they don’t have the money or time. Our *No Excuses* book shows there is much every manager can do. Coca-Cola is huge, so we wanted information from them. Teach for America is a nonprofit, so we wanted to know what you can do when you have limited resources. Balfour Beatty is not necessarily a company you think of as being warm and fuzzy, and Accenture — talk about not having time,” Robin said.

“We found the biggest difference between great workplace managers and not-so-great ones is that effective managers saw the challenge and decided to do it anyway. They didn’t let what they can’t do stop them from doing what they can do,” Robin noted. “We talk about the importance of that attitude. The remaining chapters take every one of the excuses we heard and knock them down.”

Robin uses some of the examples in her book when talking about organizational culture in undergraduate courses. However, the book applies most directly to Bradley’s Executive MBA program: “Many of our students are faced with the challenges in the book. Either they make excuses themselves or are surrounded by people who make excuses. We started with a few naysayers, but by the end, most were eager to try the strategies in their own organizations.”
Contemporary Neuroscience and Addiction

BY SUSAN ANDREWS
Photography by Duane Zehr
In the 1970s, the same decade President Richard Nixon declared a “War on Drugs,” cocaine, a powerfully addictive stimulant, gained widespread popularity and was considered the champagne of illegal drugs. By the mid-1980s and the early 1990s, crack cocaine use became rampant, especially in major U.S. cities. “Crack cocaine is delivered immediately to the brain, leaving people feeling as if they want and need more,” said Dr. Tim Koeltzow, associate professor of psychology at Bradley.

Ten years ago, Koeltzow began investigating the increased vulnerability to substance abuse for adolescents with ADHD. There may be three distinct reasons why ADHD might be linked to substance abuse: (1) individuals with ADHD may take drugs to self-medicate the symptoms; (2) the drug treatment may paradoxically promote drug craving; and (3) the impulsive nature of those with ADHD may simply lead them to make bad decisions in terms of drug usage.

To address the second possibility, Koeltzow utilized a rat model with certain features of ADHD and delivered equal doses of the drug Ritalin either continuously or multiple times a day. His research indicated that taking the drug multiple times a day promoted subsequent cocaine-seeking. “If the drug was given continuously, the dopamine levels were only modestly elevated but enough to block irrelevant events from demands on attention. It appears that dopamine synapses adapt to the continuous presence of Ritalin, which actually leads to a diminished sensitivity to cocaine. This finding means that individuals taking sustained-release medications should actually be at reduced risk of addiction.”

Stress is also a factor that promotes substance abuse and relapse though Koeltzow notes there may be an important distinction between good stress and bad stress: “Initially, something may prove stressful, but just as we gather strength in subsequent physical workout sessions, so can we become impervious to subsequent stressors.”

To assess the impact of stress on drug taking and subsequent drug usage, Koeltzow studied rats reared in an enriched environment versus those reared in a standard cage. Environmental richness may include novel objects, tunnels and running wheels. He found the response to cocaine for those reared in an enriched environment was attenuated, and they were less likely to be addicted to cocaine versus those housed alone. This situation may ultimately provide insight into the mechanisms by which some people show resilience to stress or protection from addiction.

Individual responses to threat, according to Koeltzow, are a function of environmental variability times the interaction of genetics and environment. Understanding how genes and environment interact to promote addiction is a key focus of contemporary neuroscience.

Koeltzow cautions against the idea that enrichment is always good or will be the main focus of future treatment. “What we are finding in the lab is that if rats are exposed to the novelty of an enriched environment for the first time when they are also exposed to cocaine, we see an increase in the long-term sensitivity to cocaine,” he said. “Clearly, the effect of drugs has something to do with the context in which drugs are taken. We need to further study how novelty and the environment interact with drug actions, particularly in the prefrontal cortex.”

Koeltzow is representative of Bradley’s faculty in his student-centered focus in building strong foundational skills. “The primary objective of my lab is to encourage students to solve problems or do something that no one has ever done before,” he said. “That work might be designing, analyzing, or interpreting a new experiment and then presenting at a national conference or publishing a paper.”

Koeltzow’s hope for his students is to serve humankind and, ultimately, all organisms to the best of their ability. “One day, I hope that just as we can test insulin levels to detect diabetes, we have biological diagnostics that measure the physiological parameters indicative of mental health.”
Cady, who is well known for his work with stem cells, specializes in regenerative medicine. Whether he is differentiating induced pluripotent stem (iPS) cells or assisting with a medical procedure, Cady’s research already is helping humankind.

Differentiating Cells to Cure Disease
Since bringing iPS cells to the University three years ago, Cady and his student research assistants have embarked on the challenging task of differentiating, or transforming, the generic cells into specific functioning cells. Last spring, one of the studies performed by his students Kate Lipovsky (pictured at right with Cady) and Erin Koch resulted in his lab’s first real success in this area — the creation of beating heart cells.

After beginning with a 3-D form that cultures iPS cells in an orb-like cluster called an embryoid body (due to its similar appearance to an embryo), Lipovsky and Koch only achieved limited beating on the periphery. They then changed their approach to a monolayer, or “sandwich,” form that is grown flat in a dish.

Because their monolayer protocol was based on one published at the University of Wisconsin, Madison, they expected to see maximum beating at Day 9. For 17 days, they considered starting over … until Lipovsky discovered beating on Day 26. “It’s really moving to see; it’s almost emotional,” Cady said of the achievement. “Frankly, in the laboratory, to see striking results is quite rare. We’re usually looking at data points on a graph; this is on a different level.”

Although the cells’ synchronized beating was evidence that the team had created both human heart and pacemaker cells, a verification process confirmed that fact. The routine procedure called immunocytochemistry binds antibodies
Like embryonic stem cells, iPS cells are capable of becoming any cell in the body, allowing scientists to avoid the ethical issues traditionally associated with embryonic stem cell research because iPS cells are made from adult cells. And, because an adult’s own cells could be used to generate iPS cells, an individual could have new cells made without the risk of tissue rejection. View a video of Dr. Craig Cady discussing his stem cell research and see the beating heart cells created in his lab at bradley.edu/go/works-Cady2014.
with specific fluorescent color tags to the cells’ proteins. If successful, the cells will appear with those specific colors when evaluated under a fluorescent light microscope, which is exactly what happened in Cady’s lab.

The hope for this research is that it could one day lead to a treatment for heart failure — the leading cause of death in the United States.

According to Cady, “All cardiologists can do now is keep giving patients drugs to reduce the stress on their hearts. Eventually, they die unless they receive a transplant.” That is until the iPS differentiating procedure is perfected.

Imagine someone has a heart attack. The physician could collect some of the person’s skin cells and insert the four stem cell-associated genes into them to produce iPS cells. Then, the iPS cells would be differentiated into new heart cells — customized to the individual’s body — that could be injected into the heart to repair the damage, all without the risk of rejection.

**Applying Skill to Give New Hope**

Due to his experience working with stem cells, Cady was recruited for a pivotal role in a groundbreaking surgery that occurred in April 2013. He provided the technical expertise necessary to successfully generate a tissue-engineered bioartificial trachea for transplant into 2-year-old Hannah Warren — the first such transplant in the United States.

When Warren was born, the doctors in her Seoul, South Korea-based hospital noticed she was blue and immediately inserted a tube from her throat to her lungs, so she could breathe. A CT scan revealed she was born with tracheal agenesis — the lack of a complete trachea. This condition required Warren to have both breathing and feeding tubes to live.

Dr. Mark Holterman, a pediatric surgeon at Children’s Hospital of Illinois, learned of Warren’s plight while on a business trip in Seoul. He soon returned to meet with her parents, Darryl and Young Mi, offering to help find a solution that might save the girl; it took him two years to make the surgery a reality.

As the only tracheal implant surgeon in the world, Dr. Paolo Macchiarini, professor of regenerative surgery at the Karolinska Institutet in Stockholm, was vital to the procedure. He quickly agreed to lead the surgery and donate all his time with additional assistance by Dr. Rick Pearl, head of pediatric surgery at the Children’s Hospital. Keith Steffen and Margaret Gustafson, CEO and president at OSF Saint Francis Medical Center and the Children’s Hospital respectively, then gave approval to move forward with the surgery in Peoria, with OSF agreeing to assume all costs. The next challenge was finding the right nanofiber material for the trachea and obtaining FDA approval, which was granted due to Warren’s otherwise low hope of survival.

Cady and his lab were the final pieces of the puzzle. Applying his expertise in stem cell biology, he helped complete the trachea’s preparation. Warren was given G-CSF, a drug to induce stem cell production in the blood. The team waited five days before collecting and isolating the cells used to line the nanofiber trachea, a process that was performed inside an ultra-sterile bioreactor created specifically for this purpose by the BioSpherix company of Lacona, N.Y.

On the morning of the surgery, Feras Altwal, Cady’s graduate research assistant, collected some cells from the bioartificial trachea and...
delivered them to Cady in his Olin Hall lab for evaluation. Using a live/dead assay, Cady determined the cells had attached and were healthy and expanding, so he made the final call to say the surgery was a go.

Nine hours later, the procedure concluded, and the entire team waited. In the following weeks, Warren’s recovery was slow and steady. Eventually, her parents could sleep in the same room with her and her grandparents could touch her, all for the first time. She also tasted her first lollipop, actually walked down the hall, and experienced something she never imagined — petting a dog.

Unfortunately, Warren died on July 6 due to complications found during, but not related to, her surgery. Her passing devastated not only those directly involved in the transplant but everyone who followed her story in the international news. However, her parents, the doctors, and researchers believe it was worth it, with Cady later commenting on her immeasurable contribution to the field of regenerative medicine: “She and her family were pioneers. Hannah was a great inspiration to the team.” In the end, her surgery showed the world that using a patient’s own stem cells is now a real and viable medical option.

Having learned so much in the process, Cady is part of a group working to establish a regenerative medicine team in Peoria, which he believes is the next logical step in advancing this field. “Due to the need for multiple areas of advanced expertise and the high cost of the latest medical technologies,” he explained, “the formation of collaborative, high-performing teams is essential.”

**Tackling New Challenges**

Despite all his success to date, Cady continues to seek answers to the complex questions in medicine. He will use every technology available to him to realize more advances right here at Bradley: “Large institutions certainly contribute to the field of neuroscience or heart research or cancer, but the smaller institutions also have a voice and can contribute to this area … and I think we’ve made some great progress.”
Dr. José Sánchez, assistant professor of electrical and computer engineering, explained that spatial resolution, or the overall detail, is a factor affecting the quality of an ultrasonic image. Improving that detail has the potential to improve the diagnostic qualities of ultrasound images.

In ultrasound imaging, axial resolution indicates what the minimum spacing between two structures should be, helping distinguish them, he added. Imaging is improved as the ultrasound system’s bandwidth increases. High-frequency systems tend to have larger bandwidth, but as frequency increases, the sound intensity decreases while there is also a reduction in the depth of penetration.

To deal with this trade-off between spatial resolution and penetration depth, the amplitude can be increased for the excitation signal. That increase in power also increases pressure that could have side effects, such as heating or damaging body tissue.

Sánchez, who holds undergraduate and graduate degrees from Bradley, is seeking a way to improve image quality using coded excitation and a pulse compression technique known as resolution enhancement compression (REC). This approach not only increases the transmitted energy while minimizing power but also enhances bandwidth to improve axial resolution.

“There is still much research to be completed before we can push this technology onto clinical scanners,” he said about the timeline for his work. “I am just beginning to look into REC and hybrid coded excitation techniques on ultrasonic array-based systems. If all goes well, an educated guess would be five to 10 years.”

Sánchez’s goal is to develop an ultrasonic imaging system that transmits a pre-enhanced “chirp,” the coded excitation waveform used in REC. Through senior projects with Bradley students, he has worked on the platform for coded excitation and real-time processing of data with a general purpose graphic processing unit (GPGPU). “With single-element sources, research could take up to an hour,” Sánchez noted.

“With a multiple-element source, it can be done instantaneously. Because we need to compress the received signal, more processing is required. Using a GPGPU, we are able to process the data in real time as a conventional system would.”
Advances in Enhanced Imaging

BY BOB GRIMSON
Photography by Ethan Zentz

Physicians in the future may detect tumors at earlier stages and pinpoint treatments toward specific cancers, possibly even make diagnoses without the need for biopsies.

Now, he is acquiring data and developing digital signal-processing technology to transmit amplitude- and frequency-modulated coded signals using multiple-element sources to make imaging equipment smaller, less expensive and more accurate.

A waveform generator is used to produce electric impulses. Electric voltage is put through a transducer that converts it to a pressure wave. Then, that wave “bounces” back and is processed in a computer to create an image. He works to encode those electric impulses with a special binary code that affects the impulses and, hopefully, results in a better ultrasound image.

Detecting Tumors Earlier

Sánchez also researches quantitative ultrasound techniques (QUS), which are used to study the microstructure of tissue and may allow doctors to detect some cancers, usually those that are not too deep in the body such as breast, thyroid, prostate, cervical and testicular tumors. Differentiating between tumors might be improved by using coded excitation techniques, but he needs to further research REC techniques in array-based systems.

In the future, when REC research moves into the medical community, it could provide doctors with more information through better resolution of images, improved contrast and automatic tumor delineation.

“All my work up to last year was focused on using a single-element source,” Sánchez said, adding that these sources are the simplest way to test the physics of the problem but have limitations that prevent them being used in a clinical setting.

He said his interest in this research was piqued while earning his doctorate in electrical and computer engineering in 2010. “I pursued this field because of my passion with signal processing and its potential to improve medical technology,” said Sánchez, who survived a rare form of testicular cancer. “My mentality going in, and as a cancer survivor, was any contribution that could impact people’s lives is critical. Add signal processing, and you have a match made in heaven.”
Dr. Derek Montgomery administers the day-and-night task, a test that may help identify preschoolers at risk for later ADHD diagnoses. Early intervention may help children learn strategies to pay attention and focus on self-control before they have difficulties in school.
Professor and Chair of Bradley’s Psychology Department Dr. Derek Montgomery hopes his research will prove to be effective in identifying preschoolers at risk for later attention deficit hyperactivity disorder (ADHD) diagnoses, a step that would ultimately help them as they enter the classroom. Symptoms of the disorder in children include overactivity and difficulty staying focused and controlling behavior.

“I have always wondered why a subset of children have difficulty with our tests. When they walk into a room, I see no obvious differences,” Montgomery said. “I think the roots of later problems children have in school may lie in those subtle task difficulties some kids experience.”

Montgomery’s research involves administering a day-and-night task in which preschoolers are asked to say the opposite of what they see when shown pictures of stars and the sun.

“This tests their inhibition and self-control,” he said. “The children have to stop themselves from saying what they would typically say. Inhibition is a key issue for children with ADHD.”

“One of the strongest predictors of ADHD is response variability,” he added. “When we administer a task to children, we notice that every now and then, some children have a rather long lapse between a stimulus and the response. These slow responses reflect inattention. Nobody has closely studied the relevance of these subtle, periodic lapses in preschoolers before.”

Children who showed variable response times also did poorly on the day-and-night task. “This connection is meaningful,” he explained. “It could be response variability is an objective way to determine if a child is at risk for inhibition problems and ADHD. The younger the child, the easier it is to intervene. If we can identify preschoolers at risk, it is much easier to help train them than when they are 12 or 15.”

Montgomery said training methods are already in place for young children: “Many innovative preschool programs suggest ways to help children learn strategies to pay attention and learn self-control. These programs are time-consuming and expensive, so it makes sense to identify children who are at risk and make sure they are included in them.”

Recent graduate Alexandra Bluell and current students Kristine Nichols and Klaudia Pajor assisted Montgomery with his research, which was presented in April 2013 at the International Conference of the Society for Research and Child Development (SRCD) in Seattle.

The next step in his research will be to determine if there is a link between children with highly variable responses and behavior problems during the preschool years. “This link has been studied with older children, but nobody has looked at younger children,” Montgomery noted. “Researchers are starting to develop exciting new ways to objectively assess individual differences in preschoolers’ attention and control. Our research contributes to these efforts.”
Flipping an oversized tire weighing as much as 500 pounds has become a popular exercise among athletes. Now, the workout technique is the subject of a research project for two students in Bradley’s Doctorate of Physical Therapy (DPT) program. Incorporating Dartfish motion analysis software, the students’ research compares the stance typically used when flipping tires to an alternate stance developed by Bradley alumnus Joe Terry.

The owner of the Human Performance Lab in Metamora, Ill., Terry hopes the research will show that the method he advocates for flipping tires is safer than the technique commonly used. Terry had attended a continuing education course at Bradley in which physical therapy graduates were encouraged to submit research ideas. “As clinicians in the field, we were asked what questions we have that aren’t being answered,” Terry said, noting he brought the research idea to Physical Therapy and Health Science Assistant Professor Joe Kelly.

“Evidence-based clinical practice begins with researching current trends,” Kelly said. “Fresh ideas from clinicians, such as Joe Terry, create wonderful learning opportunities for our DPT students. Clinical research is a strong thread in the DPT curriculum, and our students are expected to complete a research project with the assistance of a faculty member. The bar is set high with the expectation to disseminate their findings at either a state or national level. In fact, 12 students from the third-year class presented their research in February at the APTA Combined Sections Meeting in Las Vegas, the most well-attended conference for the profession of physical therapy.”

**An Innovative Approach**

Joe Oloffson and John Zegar, both second-year students in the three-year DPT program, have undertaken Terry’s proposed research project. Using a high-speed camera, they took videos of 18 athletes using two tire-flipping methods.

“We can see the amount of angular velocity athletes are able to produce during lifts and can determine the effectiveness of the lifts. We are working from the hypothesis that the technique that produces more angular velocity is better. We’re also looking at whether one technique is safer than the other.”

Oloffson and Zegar are sifting through data...
and making correlations. “We are trying to paint a picture, and right now, we don’t know what it will look like,” Oloffson said. “We’re hoping to learn which is the best form with the least possibility of incurring injury and which is best for strength and conditioning.”

The students noted Dartfish video technology has many applications in educational, corporate and individual settings. For instance, it is used during Olympics coverage to show two athletes on an overlapping screen as they progress through a competition such as skiing. In some running stores, customers are videotaped running, so they can buy the shoes that fit their running styles. The software can be used in coaching, sports performance and physical therapy applications.

**An Undergraduate Advantage**

Kelly also uses Dartfish when teaching a motion analysis class, the final course for health science majors. “In health science, we look at human movement as being a biological marker to health,” Kelly said. “How well we move reflects how well we manage our day-to-day activities or how we can perform from an athletic perspective.”

Using their cell phone cameras, students can take videos of people engaging in large, dynamic movements such as swinging a baseball bat or a tennis racquet, or punting a football. “Students can compare a novice and an expert,” Kelly added. “They can look at differences in technique by comparing angles and postures.”

Students analyze the videos, watching for indicators such as a weakness in a muscle group. “We can see impairments in technique and connect that to exercise to help correct the faulty movement. On a larger scale, it’s what we would instruct for physical therapy students,” Kelly said.

Kelly began using Dartfish in undergraduate and graduate classes in spring 2012 with positive response. While the software has been available commercially for several years, it entered academia toward the end of 2011.

“This is a fresh approach,” Kelly noted. “Students can have access on their personal laptops, which takes the learning opportunity out of the classroom. I am pleased by our students’ acceptance of it. We are using equipment at the undergraduate level that is usually utilized only at the graduate level.”

**Analysis**

**BY NANCY RIDGEWAY**

Photography by Duane Zehr

TOP: Mike Holloway, a second-year student in Bradley’s Doctorate of Physical Therapy (DPT) program and a strength and conditioning coach, demonstrates a new method for flipping tires developed by alumnus Joe Terry. A motion analysis of the method includes (from left) Phase 1: safe posture protecting the lower back; Phase 2: primary force production; Phases 3 and 4: transition of hand placement to push the tire and maintain momentum; and Phases 5 and 6: final execution to complete the tire flip.

ABOVE: From left, Assistant Professor of Physical Therapy and Health Science Joe Kelly and second-year DPT students John Zegar and Joe Oloffson discuss research using a camera and Dartfish software to determine if the new technique is safer.
When three teams of motivated students — engineering and business majors — joined forces in the inaugural convergence capstone projects to solve problems for high-profile clients, they did not disappoint. Seeds were planted for the success of future integrated projects within the Foster College of Business and the Caterpillar College of Engineering and Technology.

“The concept of convergence has been talked about on this campus and many other campuses for a number of years,” said Dr. Darrell Radson, dean of the Foster College of Business. “The underlying concept is that both business and engineering students will be more highly educated when they learn to collaborate on projects here and then take those skills into the workplace. But talk is only talk; action is where it really lies, and at Bradley, we are able to make it happen. We blur the academic lines, and our students work together for an extended amount of time.”

Dr. Lex Akers, dean of the Caterpillar College of Engineering and Technology, noted that much has been learned through the convergence projects, which he compared to “designing an airplane in flight.” Coursework is being prepared for a series of classes during junior year that will equip students with the skill sets necessary to
launch into the projects much faster. “Bonding the teams a year earlier also will enhance rapport,” he added. “Five new capstone projects are well under way from the fall semester. Students are working together, enhancing their leadership skills, and solving real-life problems for clients.”

Both deans agreed that their respective students learned the value of their peers’ knowledge as they broke down stereotypical barriers, demystified their majors, and learned each other’s unique terminology to foster clear communication. Professors, college advisory board members, and clients were impressed with the depth and level of skill the undergraduates honed during the yearlong process on the following three convergence projects.

**Solar Photovoltaic System**

**Engineering advisers:** Dr. John Engdahl and Dr. Marty Morris  
**Business advisers:** Ken Klotz and Carey Novak

Due to explosive growth in the solar photovoltaic panel (PV) market over the past five years, a client wanting to incorporate PV into its electric power generation portfolio set a goal for this convergence team: design a significantly lower-cost PV-mounting system so customers would benefit from the cost-effective measures and include PV as part of their power-generation solution. The client charged the team with analyzing the PV industry and market segments, estimating market potential, identifying future obstacles, benchmarking top competitors and analyzing their business models, interviewing selected and potential customers to define needs, creating and evaluating alternate business models, and recommending a course of action and implementation plan.

The overall objective of the PV project was to cut the cost of generating electricity. The driving forces in the industry analysis were rising fuel prices, technological advancements, and government mandates and incentives. The team determined the outlook for PV is positive as petroleum prices are driving customers to the PV market.

Both the engineering and business students interviewed a sampling of dealers in the network who would be selling the product and learned of the wide diversity of requirements they would need to consider when designing and marketing the solar panel. Overall profitability and a three- to seven-year return on investment were priorities.

“We worked toward an understanding of the product and each other’s language in
terms of business students communicating with engineering students,” business major Kelsy Schmidbauer said. “We also learned to balance client expectations in a timeline.”

Initially, they designed and analyzed three prototypes of solar panel mounting systems: the fixed vertical tube, the fixed tilted tube, and the one-axis tracking panel. They evaluated each model in terms of installation and structural component cost as well as the levelized cost of generating energy over a 25-year period.

After several iterations, the team recommended the fixed vertical tube design for the client. They simplified the structure, kept the costs relatively low, and improved its performance. Understanding that one design will not work for every customer in every location, they also created a system evaluator tool to help facilitate the answer to two critical questions: Can the PV produce customer value? If so, in what locations?

The system evaluator tool is basically a spreadsheet that takes into account many engineering and business inputs to produce an output for a given system. It offers solutions in four metrics: payback period, net present value, internal rate of return, and levelized cost of electricity.

Keeping cost as a key component, they also made marketing recommendations based on research of 100 countries to determine which locations are most feasible and financially attractive for the product.

**Green Global Energy Radiant Heater**

**Engineering adviser:** Dr. Marty Morris  
**Business adviser:** Ken Klotz

In 2012, the clients bought the assets of a failed business and set up a new company with the intent to market an improved product. They gave this convergence team patented technology for a low-intensity infrared radiant heating system used to warm large, open spaces such as factories and warehouses. However, the technology was created in Europe, and when installed here, some of the components and fittings were not compatible with U.S. building codes. They were tasked with redesigning the heater to eliminate defects in the original model.

Radiant heating units work by warming stainless steel tubes that emit infrared heat. The tubes are positioned to radiate heat toward the floor and can present an energy cost savings of 30 to 75 percent, depending on the application.

The team worked together to determine how to maintain product differentiation while reducing costs since the original heater, although highly differentiated, is expensive and complicated to produce.

The business students researched the commercial heating industry in terms of building size for potential clients nationwide. They examined branding and product differentiators, conducted an industry and competitor analysis, and produced a financial *pro forma*. They also reviewed climate and population density maps to determine target markets for the heater and gave the clients an estimate for the radiant heating market.

However, compiled feedback from potential clients “became the most critical component in the project,” explained marketing major Tori Scotti. “Our interviews proved that up-front costs were critical to consumers, and we worked side-by-side with the engineering students to make sure we were speaking the same language.”

After the business students provided the engineering students with market research that affected the heater’s redesign, the engineering students developed an analytical model like the existing heater, allowing the clients to go into the program and make adjustments. The analytical model predicts temperature, distance along the pipe, and heat output, helping to drive the design of a superior reflector while lowering material costs. The team also furnished the clients with
a thermodynamic model of a radiantly heated space, so the clients could compare the efficiency of forced-air heating and radiant heating to prove cost savings to customers.

They redesigned the heater with an M-shaped stainless steel reflector for increased efficiency and corrosion resistance. The team decided to incorporate a device to preheat the incoming air to increase energy-saving efficiency and provide a simple, inexpensive and persuasive product differentiator. While reducing material costs by 20 percent, part count by 30 to 40 percent, and reflector material costs by 45 percent, the redesigned system increased the radiation reflected by 83 percent.

The students’ research showed that performance contracts are popular with schools as well as companies, so the team recommended that Green Global Energy partner with corporations such as Honeywell, Johnson Controls and Chevron.

**ELGCo Hemodialysis Catheter**

**Engineering adviser: Dr. Kalyani Nair**

**Business adviser: Ken Klotz**

An internationally renowned interventional radiologist, inventor, and founder of ELGCo challenged this convergence team to design a cost-effective hemodialysis catheter. With an average annual cost of $80,000, a single dialysis patient’s treatment is a significant incentive for the medical community to find ways to reduce expenses. A specialist in medical device innovation and development, the client tasked the team with designing a device that can be positioned off the vein wall to reduce fibrin sheath buildup. He also gave them a size limitation to ease the catheter’s insertion. Focused on a project development business model, his intent is to sell the concept to a mature device company.

The team learned that hemodialysis is a procedure for kidney-failure patients, and, according to research, 50 percent of traditional catheters fail within 12 weeks. With a goal of designing a catheter that does not damage the vein nor reduce blood flow, accounting/economics major Bradley Krafft noted, “We had to get up to speed understanding hemodialysis itself because one of the most important tools is learning the client’s business.”

During their first semester on the project, students concentrated on understanding the market and identifying customer needs by conducting in-depth interviews with local nephrologists and others in the medical field, including business managers and a dialysis center’s director of operations. Their professional input was factored into the product design and business model. These experts affirmed that fibrin buildup and cutting costs are major concerns, and the statistics they provided helped with the market research. The team also reviewed current patents that are not on the market and compared their design process against current standards. They found no design that centers the catheter in the vein and off the vein wall.

Toward the end of the process, the client recommended the engineers develop a catheter with NiTiNol, a shape-memory alloy used in stents. Following his suggestion, the team designed and developed two 3-D models and 2-D drawings with dimensions and specs. The project is now in the patent process and is positioned as a cost-saving device that combats fibrin sheath buildup for improved blood flow rates.

By extending the catheter’s lifespan, the number and frequency of invasive procedures dialysis patients experience will be reduced. If patented, the business model expectation is for ELGCo to be acquired by a major healthcare company.
“Charlye,” Batesville, Arkansas
For an art professor who had no experience with guns, Margaret LeJeune discovered a new world of photographic inspiration rooted in women hunters in Batesville, Ark., in 2007.

During her first year teaching at Lyon College in Batesville, LeJeune assigned her Photo I class to take self-portraits. Born and raised in Rochester, N.Y., she wasn’t prepared to view the images her students submitted for their critique. “I was shocked to see the majority of students took photos of themselves hunting or posed with guns,” said the Bradley assistant professor of photography. “It was from this experience that the seed of my Modern Day Diana series was planted.”

Realizing that a photographic exploration...
of hunting might be a way to connect with her students and the community, the project “became a way for me to explore, analyze, and visually communicate my intellectual curiosity.”

The Modern Day Diana series, named after the Roman goddess of the hunt, evolved over several years, depicting formal portraits of female hunters in their home environments. “By examining their domestic spaces, I showed the diversity of the hunters, including their socioeconomic backgrounds, as well as the genre of hunting they participated in, such as big-game hunting or hunting for food,” explained LeJeune.

The portrait sittings would usually last two to four hours. Photographed with a 4-by-5 view camera, each scene was composed under a dark cloth, and LeJeune informally interviewed each woman about her experiences in the sport of hunting.

LeJeune said she has received accolades...
for the work and was invited to give an image-makers presentation at the 2012 Society for Photographic Education (SPE) conference in San Francisco. The series also was recognized by the curator of photographs at New York City’s Museum of Modern Art (MoMA) with a Curator’s Choice Award at the Center, Santa Fe competition. *The Modern Day Diana* has been featured on Slate.com and Actuphoto.com.

“An international network of females who hunt (DIVA) has helped me reach a wider audience, and I continue to receive emails and calls from women who would like to be part of the series,” LeJeune added. “These intimate portraits question the relationship between the home — traditionally a woman’s place — and the hunting world — typically a masculine realm.”

“Rose and Robin,” Philadelphia, Pennsylvania

ABOVE: Margaret LeJeune, assistant professor of photography at Bradley, earned a BA in studio art at Nazareth College of Rochester, N.Y., and an MFA in photography/visual studies from Visual Studies Workshop, also in Rochester. She has had international teaching experiences in Egypt, France and the Netherlands. A member of the Society of Photographic Education, the College Art Association, and the National Museum of Women in the Arts, LeJeune plans to continue her *Modern Day Diana* series, specifically targeting women hunters in the Midwest.
Researching the Behavioral Effects of Alcohol Use
Dr. Amy Bacon, assistant professor of psychology, oversees Bradley’s new Stress, Emotion, and Alcohol Laboratory (SEA Lab) designed to study college students’ drinking habits and factors influencing that behavior through both laboratory and survey research.

Nationally, alcohol use, abuse, and dependence are among the biggest health problems and are major research priorities.

Bradley is one of about 15 universities in the country to have a lab that investigates this topic in a setting that resembles an actual drinking atmosphere. “Most universities that have research bar labs are larger state schools,” Bacon said. “We are the smallest institution that I am aware of to have such a facility.”

Unlike most larger institutions, Bacon’s lab assistants are undergraduates who observe and gather data. Six students worked with her last spring, learning complex protocols associated with the study that will prepare them for advanced research in competitive graduate schools.

Participants in these studies must be 21 years old and have completed a comprehensive interview process that includes information about medical history, medications, age and other factors. Bacon’s chief priority is to ensure a safe and monitored environment while working to better understand why and how college students drink, to improve treatments for destructive drinking behaviors, and to identify students who will struggle with post-college drinking issues.

The pre-screened study participants are served alcohol in the simulated bar based on varying scenarios that elicit behavioral responses. These responses are recorded by the student research assistants and monitored by Bacon.

One of the primary reasons college students drink is to cope with stress due to social situations and relationships, depression and internal bad feelings. “These students are different from students who drink to be social, to feel good, or who may believe drinking is integral to college life as portrayed in movies such as Animal House,” Bacon said. “The latter group will likely mature out of their college drinking habits while the others may be at greater risk of having lifelong drinking problems.”

The research findings will assist Bacon in collaborating with colleagues who are engaged in the treatment and prevention of alcohol abuse in college students.
While I understood well how poetry animated students in my classroom, I wasn’t prepared for this.

If poetry is dead, the word had not yet reached Mendota, Ill., this prairie burg. On the night of my poetry reading in the village’s Carnegie Library, more than 200 folks arced around the room on chairs and carpet, spilling into the hallway. They’d come not so much for me but for the announcement of the town’s poetry contest winners, participants ranging from schoolkids to the blue-haired set.

Stillness settled ankle deep about the room. The audience harbored reverence for the notion of poetry, something they considered a private matter of public import. That scene, both Rockwellian and surreal, evoked poetry as cultural happening. Men in ill-fitting Sunday suits and guys in overalls pulleled beside their wives, dutiful husbands hauled out on an April evening better suited for planting corn.

Gushing parents photographed their award-winning kid beside me holding the certificate suitable for framing. Destined to sleep dust-bunned under the bed, that photo marked the child’s achievement with a Kodak moment. Poetry still carried societal street cred in this community, where writing a winning poem merited accolade equal to jacking the game-winning home run.

As I trundled to my car, a fellow in overalls sidled up, ball cap in hand. He admitted the wife had dragged him first to Denny’s for Thursday’s fried chicken special, then for some poetry. He shook my hand, summoning, “Buddy, that wasn’t half bad.” A Midwesterner’s compliment.

Decoded, what he’d said meant the experience wasn’t as painful as he’d expected, that he’d followed at least some of what I’d read, that for him poetry always had been foreign language from a distant land but now at least he knew enough of its strange tongue to order a suitable beer. This momentary society of self, art, and other — poetry’s afterlife — tendered scent of plowed dirt and green shoots’ sudden coming.

Poetry Is Dead?

Like most poets writing today, I grew up with the notion that poetry is knock, knock, knocking on heaven’s door. My teachers, my peers, and many literary journals reminded me that I am merely bloodying my knuckles.

While such notion has its allures, it is beguiling hooey. Poetry today enjoys a spirited afterlife. Its aesthetic hereafter has come despite, or perhaps because of, decades of commentary diagnosing American poetry as gravely moribund if not already deceased. For a fated art supposedly pushing up aesthetic daisies, poetry these days is up and about in the streets, schools, universities, clubs and online.

A gaggle of factors has contributed to poetry’s visibly invisible renaissance. The first is the sociocultural phenomenon of the Internet.
The era’s proliferation of online literary journals, poetry blogs, and digital publishing opportunities enacted a democratization of American poetry. So much poetry is available via the Web that readers regard it as the postmodern Norton Anthology.

Another contributive factor is our era’s restive aesthetic anarchy. The age lacks a monolithic authorial figure, so poets as well as readers operate free of aesthetic handcuffs. That’s just the point. Remember, Plato himself warns that poetry is not welcome within an orderly republic. Often subversive, poetry benefits from this benevolent chaos fueling the ovens of artistic experimentation and risk.

Such life-giving innovation bristles through current digital and new media poetries. Here, the poem as artifact is unchained from the printed page readers have come to know in the more than 500 years since Gutenberg. Poetry’s exodus from the page has also given fresh life to the oral pleasures of spoken word, performance, and Slam poetry whose origins indisputably extend beyond the historical range of written verse. Don’t forget, in ancient Rome one “published” one’s work by reading it aloud in public.

What’s more, even the newspaper, that hoary mode of artistic distribution, has re-emerged to champion poetry. Now there’s former U.S. Poet Laureate Ted Kooser’s “American Life in Poetry” column.

Our burgeoning culture of coffeehouses and homegrown poetry clubs proffers the humanistic benefits of artistic community. Writers find fellow writers, and readers find them, too. Most don’t make the proverbial dime from it, not enough to pay for Subway’s $5 Footlong let alone a month’s groceries. Poetry’s rewards, though, are best imagined as intellectual and emotional as opposed to pecuniary.

These dynamics — converging one evening in Mendota, Ill. — arrived like spring’s first greenery to redeem my faith in poetry and what she and I might make together.
Religion and the Body


As the first new work to appear in the Chicago History of America series in decades, The body of faith brings a crucial new perspective to the study of American religion.

In the book’s preface, Fuller details his principal argument that “new information about the human body can enrich historical description and sharpen historical explanation.” Referencing some of the body’s genetically evolved systems — pain responses, sexual passion, and emotions like shame and fear — Fuller builds the case for looking beyond traditional postmodern views focused on cultural constructs to gain insight into how human thought and experiences shape our relationships with nature, society and God.

He later makes the connection between the biological and cultural for readers: “The goal of inquiry is to explain complex expressions of human thought, feeling and behavior. The richest historical narratives must recognize that human beings are at once biological and cultural. Slighting either impoverishes our understanding of why we think and feel as we do.”

Although Fuller’s approach challenges long-held beliefs about American religious life, he does not ask readers to simply replace traditional methods with his. Instead, he suggests blending them for a more comprehensive and accurate picture.

According to Amanda Porterfield, author of Conceived in doubt: Religion and politics in the new American nation, “Fuller’s even-handed treatment of scientific explanation complements his mastery of historical sources in a forceful testament to religion’s importance in American life.”

A faculty member at Bradley since 1978, Fuller has written numerous articles and more than a dozen books, including five published by the Oxford University Press. He is considered one of the top authorities on American religious thought and regularly serves as a resource to the news media.
Accounting


Art

Cavanaugh, S. (2013). Forest; Branches. Midwest Center for Photography, Wichita, KS.


Biology


Chemistry and Biochemistry


Challenging Conventional Thought


In Torah praxis after 70 CE, Oliver challenges conventional views of the Gospels of Matthew and Luke as well as the Acts of the Apostles. He reads the works not only against their Jewish “background” but also as early Jewish literature. In doing so, he questions Luke-Acts traditional classification as a “Greek” or Gentile-Christian text and claims that Luke, who is normally seen as a Gentile, was a Jewish author.

To support his assertions, Oliver’s historical investigation explores the question of Torah praxis in each book, citing evidence that suggests several ritualistic Jewish practices remained fixtures in the Jesus movement and that Jewish followers of Jesus played key roles in forming the ekklesia well into the first century CE.
A Subconscious Debate


In his latest collection of poetry, Wrestling Li Po for the remote, Stein juxtaposes ancient Chinese poet Li Po’s quest for lyrical detachment against his own urge for communal engagement. “It’s a lovely idea, getting away from the self,” Stein has noted. “But I think it’s equally important to be grounded among your brothers and sisters.”

The result of this opposition is a refreshing examination of modern America’s skewed notions of social and aesthetic value. Touching on subjects as varied as night shift factory workers, guitarist Les Paul, toilet paper, and league bowlers, Stein brings to his poems both empathy and an astute eye for cultural foibles. Said to pull no punches, the compilation poses fundamental questions of self and art in the modern era.

Civil Engineering and Construction


Communication


Seeking Safer Bridges


Lee’s text Structural health monitoring system provides an overview of the development of an autonomous, continuous structural health monitoring (SHM) system for typical girder bridges. In his description of the system, Lee notes two key features that help owners manage their bridge assets — integration and identification. First, the system can be integrated into an active bridge management system that tracks usage and structural changes, while identification assists with determining occurrences of overload, damage, deterioration, and vehicle collisions with the structure.


In Use of CFRP in strengthening steel girder bridges, Lee examines the strengthening process used in two different structurally deficient bridges. In the first case, the live-load carrying capacity was improved using carbon fiber reinforced polymer (CFRP) bars that were post-tensioned in the positive moment region. The other bridge was reinforced through the installation of CFRP plates to the bottom flange of its girders, also in the positive moment region.


Computer Science and Information Systems


Economics


Electrical and Computer Engineering


English


Entrepreneurship, Technology and Law


Transforming Good Workplaces into Great Ones


In this follow-up to The great workplace, Robin and Burchell poke holes in excuses managers use for why they can’t create a great workplace. Filled with stories, tips, and tools for managers who want to transform their organizations, No excuses also features an extensive set of case studies on leading companies such as Accenture, Coca-Cola, Mayo Clinic and Zappos.

Ultimately, the authors expose the self-defeating mindset that can stand in the way of a great workplace and offer a path for change — leading people properly.


Family and Consumer Sciences


Study Guide for Future Teachers

Dr. D. Antonio Cantù, professor and chair of teacher education; Dr. Patricia M. Nugent, associate professor of teacher education; & Dr. Sherrie C. Pardieck, associate professor of teacher education. (2014). *ILTS test of academic proficiency (TAP)*. Piscataway, NJ: Research & Education Association.

Before individuals may be licensed to teach in Illinois, they must pass several content-area tests, including the Illinois Licensure Testing System (ILTS) Test of Academic Proficiency (TAP). To help prospective educators pass the TAP, Cantù, Nugent, and Pardieck developed *ILTS test of academic proficiency* to serve as a complete study package.

The book includes an extensive examination of each of the specific competency components — reading comprehension, language arts, mathematics, and writing — that are covered on the four subtests. It also features online diagnostic tools and full-length practice tests with timed formats, instant scoring, and feedback to help pinpoint strengths and weaknesses, as well as detailed explanations of the answers.

Because the authors are Illinois teacher educators, they possess a unique appreciation for the importance of succeeding on the exam. For this reason, they designed their study program to guide any user toward building the requisite fundamental knowledge and understanding necessary to prepare for and excel on the TAP, a fact that is explained in the introduction: “What’s best for you depends on how much time you have to study and how comfortable you are with the subject matter. Our book has a plan that you can customize to fit both your lifestyle and study style.”

**Finance and Quantitative Methods**


**Foreign Languages**


**Graduate School**


**History**


**Interactive Media**


**Leadership in Education, Human Services and Counseling**


Management and Leadership


Marketing


Mathematics


Music


Approaches to Advanced Heat Transfer


Featuring an emphasis on solving heat transfer problems using numerical methods with the aid of spreadsheets and computational fluid mechanics software, *Intermediate heat transfer* is tailored for use in advanced undergraduate and first-year graduate courses.

In the book, Fakheri covers convective, conductive, and radiative heat transfer as well as mass transfer and chemically reactive flows in an easy-to-understand manner, beginning with basic concepts and building to more complex topics to foster greater understanding by readers of all skill levels. In addition to stressing nondimensionalization as a tool for simplifying the governing equations and generalizing results, it also is the first text to cover the concept of efficiency for the design and analysis of heat exchangers.
Improving Special Education


The first of two new volumes in the Advances in Special Education series examining learning disabilities (LD), *Identification, assessment, and instruction of students with LD* begins with an analysis of the historical development of the LD field. It then provides best practices for assessing and placing students with LD before delving into issues such as cultural and linguistic diversity among students with LD.

Written by leaders in the discipline, the book concludes with thorough discussions of various instructional issues, including differentiation, interventions and positive behavior supports.


As noted in the preface of this and the previous volume of the Advances in Special Education series, *Practice concerns and students with LD* is “an excellent supplementary text for advanced undergraduate special education majors and graduate students who are looking for detailed, comprehensive, and current information for their research papers or theses.” The book opens with a strong ideological rationale and convincing research arguments for the inclusion of students with LD in general education classes. It then provides knowledge base components for general and special educators related to effective practices and interventions such as reading, written instruction, mathematics, and social skills training, followed by thorough discussions of response to intervention and the use of assistive technology with students with LD.


Written in a reader-friendly style with many examples and suggestions, *Effective inclusion strategies for elementary teachers* deals with key issues elementary teachers face when instructing students with LD. According to its introduction, “This book helps teachers understand common characteristics of students with specific special needs and provides specific strategies they can employ in the classroom setting to meet the needs of these learners.” From an overview of disability laws and a definition of *inclusion* to coverage of specific disabilities and references to Web-based resources, elementary-level educators are sure to view this guide as a vital tool for their classrooms.
Building Algebra Knowledge


A companion text to the instruction and guidance provided in *Algebra I for dummies*, Sterling’s *1,001 Algebra I practice problems for dummies* offers users 1,001 opportunities to practice solving algebra problems. The book opens with basic operations then transitions to algebraic properties, polynomials, and quadratic equations before concluding with graphing. With step-by-step explanations of each solution, it also includes a one-year free online subscription to every problem plus personalized progress reports to help identify strengths and weaknesses.


Similar to Sterling’s other 2013 publication, *1,001 Algebra II practice problems for dummies* offers both high school and college students extra practice on major algebra topics. Featuring the same online access and customizable practice as the prior volume, this book starts with a review of algebra basics and ends with sequences, sets and counting techniques. The problems cover a range of difficulty and styles, ultimately helping students prepare for probability and statistics.
Orfe, J. (2013, April 21). Stellar Wind. Composed for Dr. Erin Lesser and Lawrence University; premiered at the New Music Ensemble concert, Appleton, WI.


Nursing


Philosophy and Religious Studies


Physical Therapy and Health Science


Physics


Political Science


Psychology


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### Teacher Education


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### Interdepartmental Collaborations

#### Civil Engineering and Construction; Chemistry and Biochemistry


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### Entrepreneurship, Technology and Law; Management and Leadership


### Nursing; Family and Consumer Sciences


### Teacher Education; Family and Consumer Sciences; Leadership in Education, Human Services and Counseling; Nursing; Physical Therapy


### Teacher Education; Social Work; Biology

Examining Science Education — Past, Present and Future


Building on their previous work, Finson and Pedersen define the meaning of visual data as it relates specifically to science education in *Visual data and their use in science education*. Containing contributions from individuals actively researching and teaching with visual data, the book examines brain function associated with the processing of visual data as well as conceptual learning and change. It also addresses the use of visual data in science classrooms from elementary to college.


Today’s science teachers owe a debt to the educators who came before them — who shaped and reshaped the face of science education. The new Pioneers of Science Education series strives to recognize those trailblazers beginning with its first volume, *Going back for our future*. Explained as “an attempt to capture and record memories from the pioneers themselves or from those who worked closely with them,” the book recognizes both well- and lesser-known pioneers who held significant roles as mentors and teachers. It also reveals the extensive network connecting these individuals and how it fostered their development then and continues to support educators now.
Historic Westlake Hall Earns LEED Gold

Following a $24 million renovation and expansion, iconic Westlake Hall earned LEED Gold certification in December 2013, offering a healthy learning and working environment for Bradley’s students, faculty and staff. One of the two original academic buildings on Bradley’s campus, Westlake was the second University structure recognized by the U.S. Green Building Council (USGBC). The Hayden-Clark Alumni Center earned LEED Silver certification in January 2013. Westlake’s select sustainable features include:

1. Natural lighting from the open atrium and windows of the original exterior affect 90 percent of spaces
2. Auto-controlled interior lighting
3. A controlled HVAC system, heat recovery wheel, and chilled beam technology with CO₂ sensors add cooling by monitoring carbon dioxide levels in the building
4. Water use is reduced by more than 35 percent
5. A rapidly renewable resource, bamboo plants adorn the building’s walls

Visit bradley.edu/go/works-WestlakeLEED to read about more sustainable features and Westlake’s recognition as one of five projects noted for outstanding design for adaptive reuse in American School and University magazine’s 2013 architectural portfolio.