

# MEASURE

THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY

**ASU**  
ARKANSAS STATE  
UNIVERSITY

FALL 2012

# ECONOMIC DEVELOPMENT



**DISCOVERIES TO CHANGE OUR WORLD**

## WHAT IS MEASURE<sup>®</sup>?

How do we measure our commitment to research?

How do we judge successful scholarship?

How do we place value on creative expression?

How do we appraise the impact of service?

- Student engagement?
- Productivity?
- Awards and expenditures?
- Comparison with our peers?
- National and international recognition?
- Influence in the field?
- Solutions to real world issues?
- Economic impact?
- Community enrichment?

The answer is: all of these, and more.

At ASU, we value each discipline and their measures of success. MEASURE<sup>®</sup> is a showcase of ASU success in a variety of disciplines.

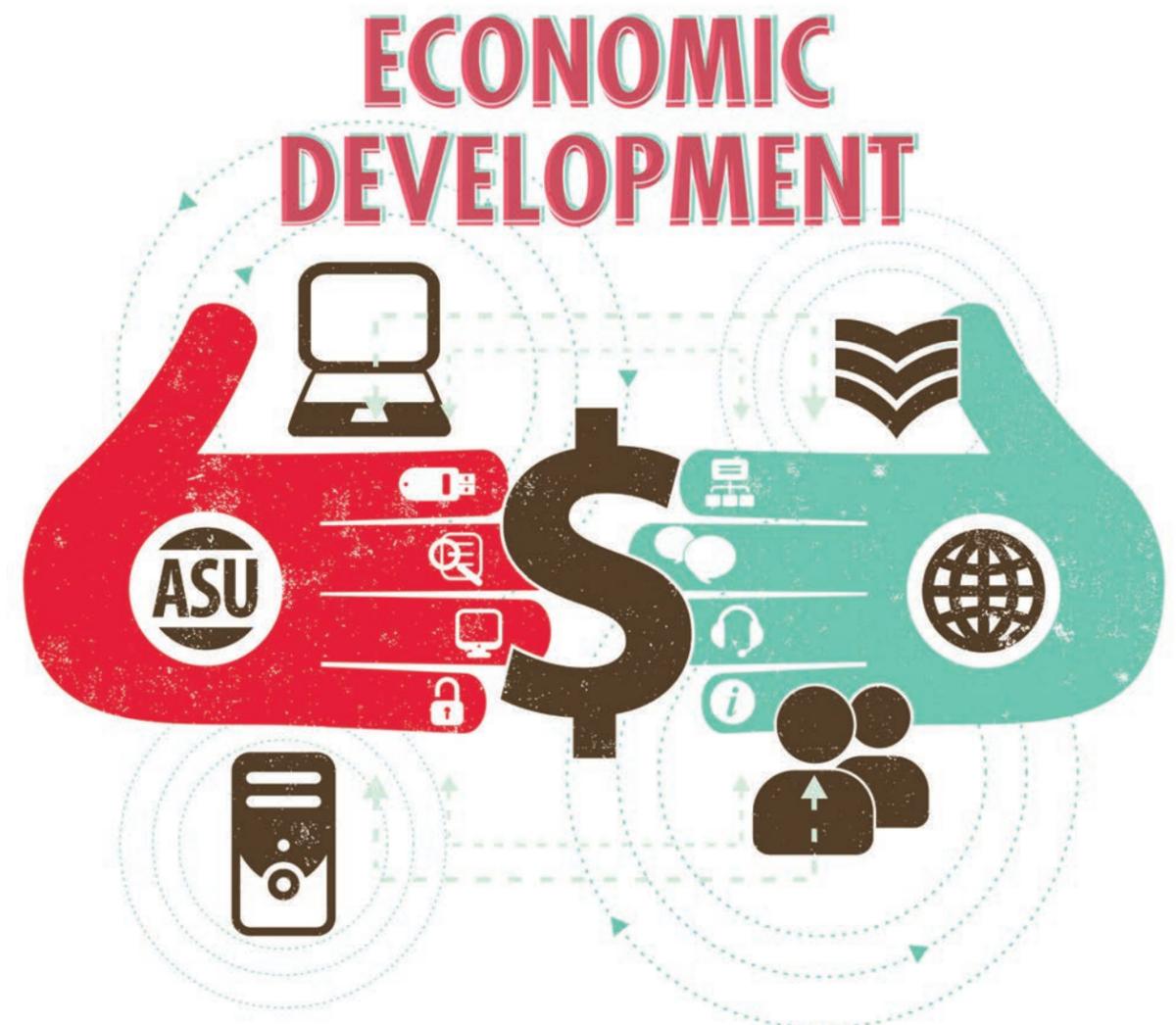
### *Arkansas State University Mission Statement*

Arkansas State University educates leaders, enhances intellectual growth and enriches lives.

Arkansas State University is an equal opportunity institution with a strong commitment to the achievement of excellence and diversity among its students, faculty and staff. ASU does not discriminate on the basis of race, color, religion, age, disability, gender or national origin or any other legally protected status. Any questions regarding the university's Affirmative Action policies should be directed to the Affirmative Action Program Coordinator, P.O. Box 1500, State University AR, 72467, telephone 870-972-3658.

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**DISCOVERIES TO CHANGE OUR WORLD**

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# MEASURE

THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY

## ONLINE:

[www.astate.edu/research-transfer](http://www.astate.edu/research-transfer)

## EXECUTIVE EDITOR

Julie Thatcher

[jthatcher@astate.edu](mailto:jthatcher@astate.edu)

## SENIOR EDITORS

Cheryl Goad Dison

[cgoad@astate.edu](mailto:cgoad@astate.edu)

Joshua Potter

[research@astate.edu](mailto:research@astate.edu)

## GRAPHIC DESIGN

ASU Office of Publications & Creative Services

Heath Kelly

Michael Johnson

[pcs@astate.edu](mailto:pcs@astate.edu)

## PRINTING

ASU Printing Services

[dmaloch@astate.edu](mailto:dmaloch@astate.edu)

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Dr. Tim Hudson

Ladies and Gentlemen:

Welcome! With much enthusiasm, I present the second edition of **MEASURE : THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY®**, an annual magazine devoted to showcasing the many scholarly activities at ASU. This publication stemmed from the growing importance of research on our campus, and the desire to highlight the impact of our activities to the internal ASU community as well as our friends across the globe.

In this issue, we focus on the many ways ASU programs contribute to the economic development and viability of our region, state, nation and world. We are proud of ASU's proactive and nimble response to ever-evolving economic challenges and opportunities.

We first introduce you to several new additions to ASU administration (including me), program leaders from the Delta Center for Economic Development, the Catalyst Incubator, the Center for Digital Initiatives, the CI-TRAIN project and the Beck PRIDE Center. They describe the importance of their programs, including their meaningful economic contributions.

Our publication would be incomplete without highlighting some of the amazing student research on our Jonesboro campus. In our final article, we showcase a few of the winners from the most recent **Create @ STATE: A Symposium of Research, Scholarship & Creativity**.

We hope you enjoy this edition of **MEASURE®** and welcome your comments and suggestions.

Sincerely,

A handwritten signature in red ink that reads "Tim Hudson". The signature is fluid and cursive, with the first name "Tim" and last name "Hudson" clearly legible.

Tim Hudson, Ph.D.  
Chancellor

## A New Era for Scholarly Activity

*With great excitement, Arkansas State University welcomes a new chancellor and four deans to Jonesboro. The influx of these new administrators adds to the burgeoning culture of research and creativity. These leaders bring opportunity to further stimulate the ASU community's engagement in innovation and scholarship.*

### ASU'S NEW CHANCELLOR

Dr. Tim Hudson's appointment began on May 1, 2012. His desire to be "part of a dynamic leadership team that will move ASU to the next level, one characterized by innovative research conducted by world-class faculty..." keeps him focused on the future. In his first months, Hudson highlighted ASU's need "to enhance our research, especially competitively funded research and creative activities." Hudson also said he wants to support ASU's faculty to engage in more and relevant research, meeting global standards and preparing students for leadership in a globalized world.

Dr. Hudson most recently served as the vice chancellor of the Texas Tech University System. He holds a Bachelor of Arts degree in history and Latin American studies and a Master of Arts degree in geography from the University of Southern Mississippi. He earned his doctoral degree in geography from Clark University.



ASU System President Dr. Chuck Welch welcomes Dr. Tim Hudson as the newest Chancellor for Arkansas State University.



Dr. Tim Hudson, Chancellor

## Meet the New Deans

### COLLEGE OF COMMUNICATIONS

Dr. Brad Rawlins is excited by the opportunity to lead the college and acknowledges the importance of preserving its well-earned reputation in the communications industry – locally, regionally and nationally. He hopes the college will prepare students to be thought leaders in their communications professions; eager and able to anticipate and create the next communications innovations. Rawlins plans to encourage more applied research in the college, thus ensuring graduates are equipped to think analytically about a discipline that is, in Rawlins' words, "critical to every human endeavor."

Dr. Rawlins holds Bachelor of Arts degrees in communications and foreign languages from Washington State University, a Master of Arts degree in advertising and public relations and a doctoral degree in mass communications from the University of Alabama. He most recently served as department chair in the Department of Communications at Brigham Young University.



Brad Rawlins

### COLLEGE OF EDUCATION

Dr. Thillainatarajan Sivakumaran recognizes the critical and far-reaching role ASU plays in teaching Arkansas' future educators. He notes the importance of creating and "facilitating opportunities for faculty to innovate, grow and be leaders in the field." Dr. Sivakumaran is eager to develop programs with local, regional, national and international appeal, thus more deeply preparing graduates for an increasingly global economy.

Dr. Sivakumaran most recently served as the associate dean for the College of Education and Human Development at the University of Louisiana at Monroe. He holds a Bachelor of Science degree in molecular and cellular biology and a Master of Science degree in secondary science education from the University of Washington in Seattle. His doctoral degree is in instructional technology from the University of Tennessee at Knoxville.



Thillainatarajan Sivakumaran

### COLLEGE OF FINE ARTS

Dr. Donald Bowyer is excited about building onto the success and artistry already palpable in the college. He noted, "Everything we do in the College of Fine Arts is a creative activity – acting, painting, performing, sculpting, set design, graphic design, musical composition – it all falls into that realm." Dr. Bowyer plans to further encourage student and faculty thespians, artists and musicians to face outward through increased performances, exhibitions and publications – with activities in the region and around the globe.

Dr. Bowyer most recently served as the music department chair at the University of Alabama in Huntsville. He holds a Bachelor of Arts degree in music from West Virginia Wesleyan College and a Master of Arts degree in trombone performance from California State University, Northridge. He earned his doctoral degree in trombone performance and jazz pedagogy from the University of Northern Colorado.



Donald Bowyer

### COLLEGE OF HUMANITIES & SOCIAL SCIENCES

Dr. Lauri Umansky values the opportunities Arkansas State University affords faculty and students alike to engage meaningfully with ideas, creative expression, scholarly debate and real-life applications of knowledge. She aims to maximize those opportunities during her tenure as dean. Research, she said, "is at the crux of what we do in the College of Humanities & Social Sciences. Indeed, we gather at universities to inspire and galvanize each other to discover fresh perspectives, new knowledge. We then pour our discoveries back into our teaching and into our scholarship. We've got a rich brew here at ASU. I'd like to see it get even richer."

Dr. Umansky most recently served as associate dean of the College of Arts and Sciences and as the interim associate vice president of Academic Affairs at Suffolk University. Dr. Umansky holds a Bachelor of Arts degree in women's studies from the University of Massachusetts-Boston and a Master of Arts degree and a doctoral degree in American civilization from Brown University.



Lauri Umansky



Why "incubate" startup businesses?

- \* "incubate" services
- \$1 public operating subsidy to incubation generates \$30 in local tax revenue
- 3x Increased success rate of new business
- 84% Incubator graduates that stay in their communities

\* According to the National Business Incubation Association (NBIA)

# BRINGING JOBS TO NORTHEAST ARKANSAS

*Last year Business Insider projected Craighead County, Arkansas, as one of the American locations most likely to become the next Silicon Valley. That bold assertion was based on the region's "sizable workforce, vibrant local economy and the presence of a small college or university."*

*ASU's College of Business is working overtime with the ASU Research and Development Institute (RDI) to bring Business Insider's prediction to fruition by offering specialized facilities and services to boost qualified businesses in Northeast Arkansas.*

The ASU Research & Development Institute (RDI), Northeast Arkansas business community, Arkansas State University, Arkansas BioSciences Institute, Delta Center for Economic Development, U.S. Small Business Administration and the U.S. Department of Commerce Economic Development Administration collaborated to create the CATALYST Innovation Accelerator program. CATALYST offers business services, executive office suites and conference space, and state-of-the-art laboratory facilities to new and growing science and innovation based ventures.

CATALYST is located inside the Arkansas BioSciences Institute on the Arkansas State University campus in Jonesboro. It marks an exciting step in efforts to foster innovation-based economic development, with the ultimate goal of creating opportunities that will develop and retain the most talented among our region's students and workforce.

Please visit the CATALYST web page for further information. Contact us to inquire about how CATALYST can support cultivation of your idea and growth of your innovative business.

The idea is that, at graduation, a company is sufficiently healthy to sustain operations in commercial space.



Alan McVey



Brian Rogers

## A LOOK AT THE OFFERINGS

The Delta Center for Economic Development (DCED) is an outreach service of the College of Business and coordinates ASU's economic development activities. The DCED is proud of its programs and three facilities. The headquarters is a new, state-of-the-art, 22,000-square-foot facility in the heart of campus, funded in-part by the U.S. Economic Development Administration and offers executive offices, classrooms, conference rooms and a custom boardroom.

Two other facilities under the DCED are primarily purposed with business incubation activities. One is the Krueger Drive facility located in the Jonesboro Industrial Park. The other, known as Catalyst, is located in the Arkansas Biosciences Institute (ABI) building on campus and focuses on technology-driven small businesses.

The DCED offers a number of services and resources to assist entrepreneurs and growing businesses, particularly those accepted as clients of the DCED business incubation program. These include training; access to specialized facilities and equipment at ASU; connections to prospective funding sources; close proximity to other

entrepreneurs, faculty and students; market and competitive research; and professional coaching designed to assist business progress and growth.

Alan McVey, DCED director, is a seasoned economic development professional who worked in Arkansas' State Department of Economic Development before transitioning to ASU in 2006. His vision is to develop the potential of both ASU's innovations and the region's resources. "Technology that is used across the economy – that drives production, e.g. food processing or alternative energy – all those companies are driven by technology-based systems," he said.

## INCUBATION: TAKING THE NEXT STEPS

The DCED Krueger Drive facility offers training and conference rooms, executive offices, and an open, flexible work space of more than 3,000-square-feet that is suitable for a pilot scale distribution or production operation.

Brian Rogers joined ASU in 2010 as the director of the Research and Development Institute (RDI) Catalyst Innovation

Accelerator. "The purpose of the Catalyst program," Rogers said, "is to create jobs in the region by promoting a culture of innovative entrepreneurship and providing services and support directly to early stage and growing innovation driven opportunities."

Catalyst is focused on growing STEM (Science, Technology, Engineering and Math) and other related, high-paying jobs in Northeast Arkansas. As a consequence of its location on campus in the ABI building, Catalyst client companies are steps away from faculty experts, students and cutting-edge research equipment. Catalyst facilities include 10 executive offices, conference rooms, and 18 laboratories.



Delta Center for Economic Development Main Conference Room

## GRADUATION

The ultimate goal of the DCED and its business incubation program is to launch strong companies into the Northeast Arkansas economy. With assistance from DCED professionals, companies accepted as clients into the program will develop a milestone-driven plan that will project progress and growth designed to propel the client towards graduation from the program. The idea is that, at graduation, a company is sufficiently healthy to sustain operations in commercial space.

A benefit of a robust business incubation program is facilitation of industry-university relationships, especially those involving student development and collaborative research.

"ASU is a tremendous resource that is not really being utilized to the fullest right now, in terms of scientific and engineering innovators," McVey said. If all goes according to plan that will change. More companies will take advantage of the many opportunities to collaborate with and receive services from ASU.



Catalyst provides a convenient, on-campus access point for companies to leverage ASU expertise and resources, as well as a hub for collaboration among companies and ASU students and faculty.

## SUCCESS STORIES FROM ASU BUSINESS INCUBATION

→ Rural Sourcing, Inc. is a high-tech company started in Jonesboro that captures outsourced software development domestically, rather than losing it to overseas competitors. Henry Torres, director of the Interactive Teaching and Technology Center at ASU, founded Rural Sourcing, Inc., and helped develop it to

\$1.2 million in sales and 21 employees within 24 months. For a time, the Jonesboro branch of Rural Sourcing, Inc. was housed in the Krueger Drive facility before transitioning to a space in downtown Jonesboro.

→ The Krueger Drive facility played a crucial role in bringing Nordex, an international wind turbine production company, to Northeast Arkansas. Nordex was temporarily housed in the facility before opening its 150,000-square-foot plant in 2010. This represents a \$40 million investment in Jonesboro.



Development of Catalyst was made possible by funding awarded to ASU in 2009 by the Economic Development Administration of the U.S. Department of Commerce and the U.S. Small Business Administration.



For more information and to watch an ASU-produced video, scan this QR code with your smart phone.



THE POSITIVE REGIONAL ECONOMIC IMPACT OF THE BECK PRIDE CENTER FOR AMERICA'S WOUNDED VETERANS IS WITHOUT QUESTION. THIS CENTER PROVIDES PERSONAL REHABILITATION, INDIVIDUAL DEVELOPMENT AND EDUCATION [ PRIDE ] FOR ELIGIBLE PRESENT DAY CONFLICT VETERANS SERVING IN ALL BRANCHES OF THE MILITARY.

*Often when veterans return from combat, they experience substantial difficulty transitioning into civilian roles as students and in the workforce.*

*The Beck PRIDE Center, housed in the College of Nursing & Health Professions, provides a safe and welcoming environment for rehabilitation, civilian transition skills and necessary educational and workforce competence. This is no easy task, as traditional obstacles are exacerbated by the experiences of war. For many, moving from the disciplined military lifestyle to the private sector is daunting. The Beck PRIDE Center stands ready to serve.*

Visit our website for more information: [www.astate.edu/cpi/beckpride](http://www.astate.edu/cpi/beckpride)

★ HEALING AMERICA'S FINEST ★



Susan Hanrahan

## HISTORY & PURPOSE

The Beck PRIDE Center was established in October 2007 by Susan Hanrahan, dean of the College of Nursing and Health Professions, and Susan Tonymon, the center's original director, following a \$1 million gift from ASU alumni Buddy and Charlotte Beck of Fairfax Station, Virginia. They envisioned supplementing, rather than replacing, other existing federal, state and university programs that benefited veterans.



Sandra Worlow

Services include physical and mental rehabilitation, education assistance, academic advising, career and business planning, mentoring, socialization, social services and community referrals. Since its inception, the center has served more than 400 veterans, with around 130 active participants.

The holistic approach is particularly important to note. "We often find members of the veterans' families need assistance in helping them come to terms with the challenges presented by the veterans' combat-related injuries," said new Director Sandra Worlow. Strengthening veterans' support networks at home enhances personal healing and/or educational success. This is vital in the journey towards reentering the workforce.

## MEETING THE CHALLENGE

Daniel Buck, 32, a U.S. Marine Corps veteran, found support at the center. After serving from 2002-2010 in three different Iraq tours, Buck returned to Jonesboro suffering from bulging disks and Post Traumatic Stress Disorder (PTSD). When his father shared what he knew about the center, Buck decided to give it a try.

Since engaging the center, Buck has attended classes every day in the Physical Therapist Assistant Program. He also received physical therapy, including hippotherapy, and made a number of invaluable social and community connections. Buck said, "The Beck PRIDE Center helped me figure out what to do and how to do it."



The names of 6,254 service members who served and died for their country in Iraq and Afghanistan since October 10, 2001 were read as part of the National Roll Call on November 11, 2011. This event was sponsored by the Beck PRIDE Center and the Arkansas Student Veterans Organization.

Center intern Brent Tipton, is pursuing his Master of Rehabilitation Counseling degree after serving 22 years as a National Guard Captain and completing three tours after the September 11, 2001 attacks. According to Tipton, veterans often find it difficult to put their thoughts and feelings into perspective. They wonder, "Why do I feel the way I do?"

Fortunately, clients know Tipton relates with genuine understanding and are responsive to his message. "There is help available, and we will help you find it." Buck and Tipton appreciate the value of higher education and look forward to entering the civilian workforce.

## RECOGNITION & MOVING FORWARD

The Beck PRIDE model for veteran services is catching attention as a replicable model for other universities nationwide. The U.S. Department of Defense (DOD) recently recognized the center's exceptional progress and appropriated \$1.4 million for program evaluation and replication design.

Many universities want to instill a military-friendly culture and offer seamless services yet lack necessary guidance. This programmatic blueprint will document service effectiveness, strategies for assistance and disseminate best practices information.

The Beck PRIDE Center hopes that by creating this roadmap, its mission of transforming veterans' futures will be realized on a national scale.



On March 14, 2012, the Beck PRIDE Center hosted interaction between student veterans and Eisenhower students. The Eisenhower National Security Series is the U.S. Army War College's communication and outreach program designed to encourage dialogue on national security and other public policy issues between its students and the public.

**"We often find members of the veterans' families need assistance in helping them come to terms with the challenges presented by the veterans' combat-related injuries. Strengthening veterans' support networks at home enhances personal healing and educational success."**

## EQUINE ASSISTED THERAPY

Hippotherapy is an integrative physical therapy treatment strategy that combines equine movement with physical rehabilitation. Equine movement provides multi-dimensional movement, which is variable, rhythmic and repetitive. These qualities offer the patient an invaluable opportunity to increase trunk strength

and control, balance, overall posture and endurance, address weight bearing, and motor planning as they perform subtle adjustments while riding a horse. This results from the horse's walking gait, which elicits movement responses from a rider remarkably similar to normal human gait.



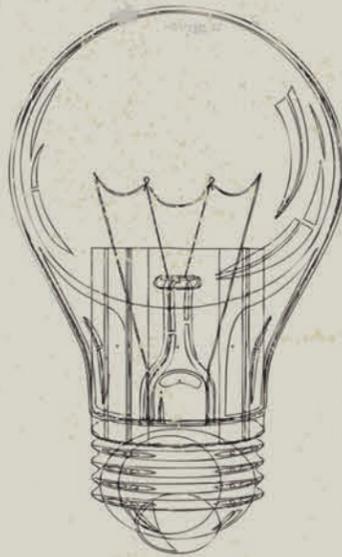
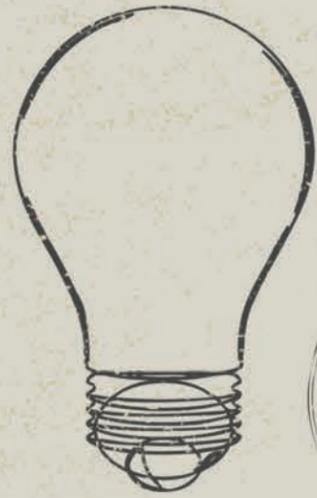
The Hippotherapy program at ASU is overseen by Dr. Roy Aldridge, professor of Physical Therapy. Aldridge has more than 10 years of experience in equine-assisted therapy. A share of the \$1.4 million DOD award funds his project entitled, "Effects of Hippotherapy on Functional Improvements with Individuals with Disabilities." The target recipients are composed of Beck PRIDE Center participants or referrals.



For more information and to watch an ASU-produced video, scan this QR code with your smart phone.

# VISUALIZING POTENTIAL

*incandescent bulb:  
initial sketch -  
need to add filament  
in wire-frame*



*Start building up  
surface areas  
with flat shapes then begin  
adding in thread detail and  
select a light source.*



It's a process. Having the ability to see the end product from a sketch, a photo or simple notes takes great skill. This light bulb is just an example. Now imagine what it would take to do this with a house and all of its furniture, or an entire university campus, or a video game and its environments. That is the specialized creativity of CDI.



*good light direction!  
add filament structure and modeling -  
choose any textures if desired*



*add final highlights  
and then render*



**CDI** THE CENTER FOR DIGITAL INITIATIVES  
AT ARKANSAS STATE UNIVERSITY

*Under the direction of Alyson Gill, associate professor of Art History, the Center for Digital Initiatives (CDI) promotes ASU's position as a leader in the creation of virtual interactive environments and data visualization tools for cross-disciplinary teaching, research and service.*

*Established in April 2011, the CDI secured more than \$500,000 in sponsored projects in fields ranging from scientific education to heritage studies and restoration. These dollars support faculty development, engage students in cutting edge projects, produce visualization tools and bring regional, national and international attention to ASU.*



Alyson Gill

## VISUALIZING PROJECTS

In 2008 Gill created ASU's virtual campus and has since expanded to six online, virtual campuses. In June 2010, the "Blueberry Gallery," a virtual representation of the ASU Bradbury Gallery, was designated a "Top-Ten Destination in Second Life" by Linden Labs, a distinction that flooded the simulated environments with visitors.

ASU faculty use the Center for Digital Initiatives (CDI) to create innovative visualizations for classroom use. One example is the virtual replica of the George Harp Field Station, created for the College of Sciences and Mathematics. The CDI also showcased Dr. Harp's extensive dragonfly collection through a geomapping project. In addition, the CDI created a virtual hospital for the College of Nursing and Health Professions to train future health care professionals. Furthermore, art history students and faculty routinely use CDI models in art history courses.

Faculty also use the CDI expertise for grant proposals. Data visualization programs offer new ways of engaging information, imagining possibilities and solving problems.

## VISUALIZING HERITAGE SITES

In 2010, the CDI partnered with ASU Heritage Sites to bring all sites online. These include the Dyess Colony, Lakeport Plantation, Hemingway-Pfeiffer House and Barn, Southern Tenant Farmers Museum and Rohwer Japanese-American Internment Camp. These projects are truly collaborative, requiring the expertise of architects, 3D modelers, photographers, undergraduate and graduate students, site directors and members of the community, as well as Dr. Ruth Hawkins, director of Heritage Sites and her staff. Online models draw attention to the actual sites and serve to revitalize the tourism economy of the Arkansas Delta with worldwide online visitors.



## The CDI has provided practical visualizations of how infrastructure for industrial, business and community development could improve communities in economic crisis.

For example, the Dyess Colony in Dyess, Arkansas, was a resettlement colony for impoverished farmers during the Great Depression. This site is also the location of Johnny Cash's boyhood home. The CDI worked extensively with Dr. Hawkins and members of the Cash family to create a perfect, virtual recreation of the Cash home.

These heritage projects culminated in a recent prestigious National Endowment for the Humanities Institute for Advanced Topics in the Digital Humanities award. This \$200,000 award will support a summer 2013 training institute in 3D visualization of cultural heritage sites for 20 humanities scholars.

\$2.6 million Housing and Urban Development grant through the East Arkansas Planning and Development District. As part of this large grant team, the CDI worked closely with ASU's Delta Center for Economic Development and three communities in Northeast Arkansas to create a list of unrealized assets in those communities. The CDI then provided practical visualizations of how infrastructure for industrial, business and community development could improve communities in economic crisis. This proves invaluable to the economic recovery of the Mississippi Delta.



CDI model of a diner in the Dyess Community in Dyess, Arkansas. This is part of the Johnny Cash Boyhood Home Project through the Delta Heritage Sites of ASU.

## VISUALIZING OPPORTUNITY

The CDI bridges the gap between the traditional domains of academia, the community of Jonesboro and the rest of Northeastern Arkansas. Likewise, it brings locally spent, external funding to ASU. As it continues to secure grants and contracts, it is clear the CDI is an emerging contributor to the strong future of economic development at ASU.



The CDI is further engaged in other diverse projects, such as creating a facebook smoking cessation game, funded by the Arkansas Department of Health.

## A DIFFERENT KIND OF VIRTUAL TOUR...



filtration system and then placed it in a factory environment to showcase the power of this incredible system. This exciting animation takes viewers on a 3D tour alongside dust particles as they travel from the



factory tables into the inner workings of Camfil Farr's filtration device. Animations offer companies like Camfil Farr a distinct advantage when working with prospective clients. For this project, the CDI staff worked alongside



Camfil Farr's incredibly creative team, and the final product is a tremendous example of the CDI's innovative collaborations.

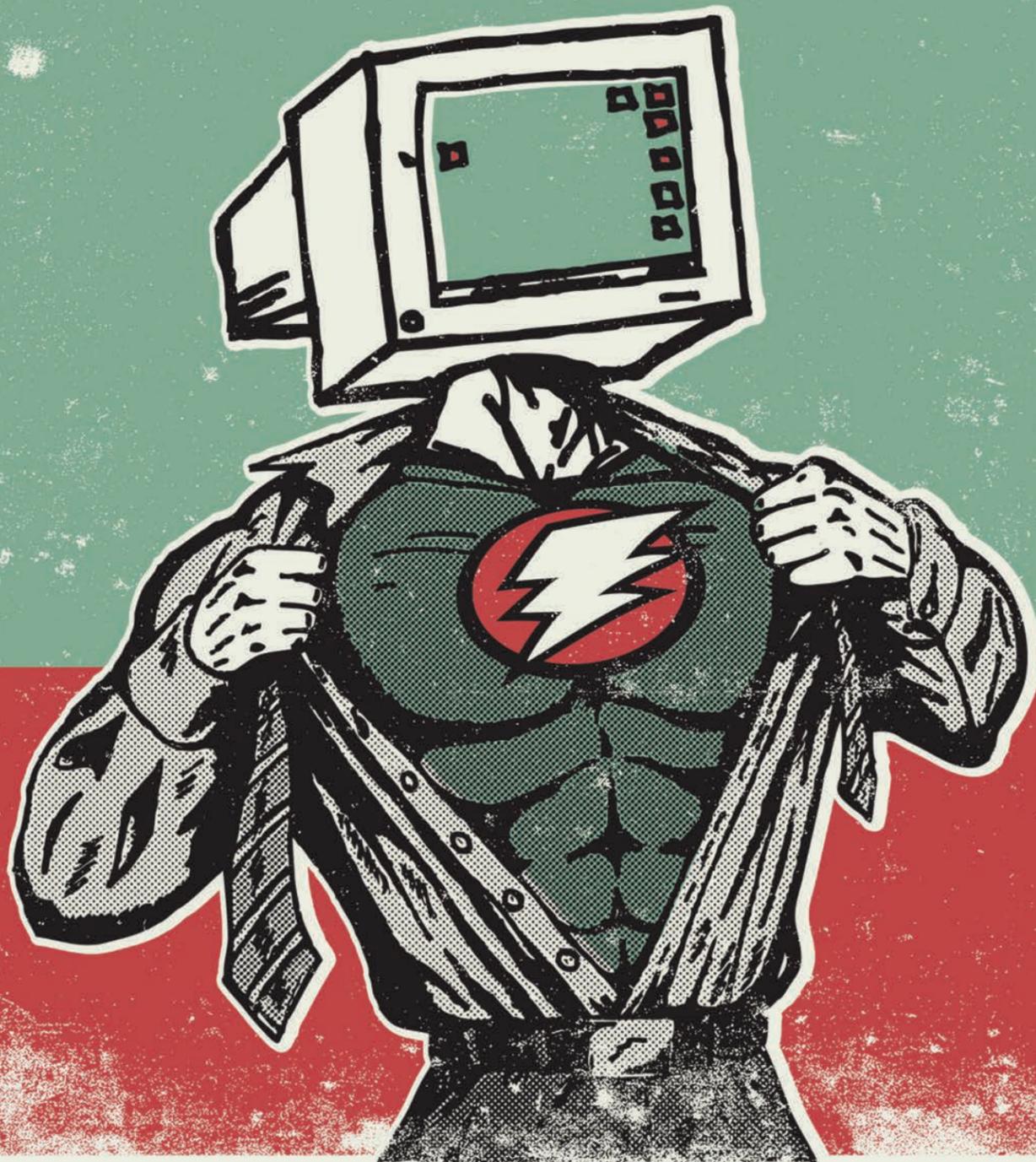


For more information and to watch an ASU-produced video, scan this QR code with your smart phone.

STRONGER THAN A LOCOMOTIVE. ABLE TO CRUNCH DATA AT LIGHTNING SPEEDS. IT'S A BIRD. IT'S A PLANE...

# - IT'S THE - SUPER COMPUTER

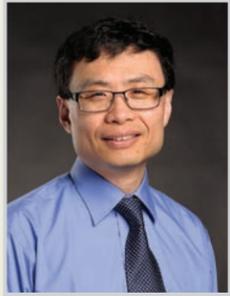
**HIGH-PERFORMANCE COMPUTING AT ASU**



**Cutting-edge technology is a key attribute of top-tier institutions of higher education. Access to new technologies is imperative for students pursuing careers in computer sciences and mathematics where breakthroughs depend upon new technologies. Competitive computing capacity is vital to researchers, educators and innovators in today's job market.**

*ASU gained such technology when a consortium of seven institutions submitted the CI-TRAIN proposal to the National Science Foundation in 2008. This successful proposal expanded cyberinfrastructure by connecting people, knowledge databases, computers, software tools and hardware equipment.*

*ASU leveraged this award, with funding from the Arkansas Science and Technology Authority, the College of Engineering, the College of Sciences & Mathematics, and Information Technology Services to purchase a Dell five-node cluster and built a High Performance Computing (HPC) platform. Comprising 3,628 cores and more than 18 terabytes of storage, it was the largest Graphics Processing Unit (GPU) cluster in Arkansas at the time of its installation.*



Hai Jiang

## EXPANDING POSSIBILITIES

Hai Jiang, associate professor of Computer Science, is Arkansas State University's "campus champion" for CI-TRAIN, representing ASU in the 2008 proposal process. In 2011, Jiang's vision of the research and educational impact of improved cyberinfrastructure was realized with the arrival of the platform.

Regarding applications, Jiang helps researchers in other fields understand the potential of the platform by establishing a Compute Unified Device Architecture (CUDA) Teaching Center at ASU. At its inception, this center was one of only 12 centers in the United States, as recognized by major GPU manufacturer NVIDIA.

**"It's the trend...nobody can stop it. As ASU makes strides toward becoming a research-intensive university, an HPC platform is a must-have."**

Jiang is familiar with the need for such capacity in today's rapidly advancing world. "It's the trend," Jiang said. "Nobody can stop it. As ASU makes strides toward becoming a research-intensive university, an HPC platform is a must-have."

Jiang also teaches an HPC course each year, providing learning opportunities for students and faculty such as Hideya Koizumi, assistant professor of Chemistry, and Hong Zhou, assistant professor of Statistics.

Maximizing utilization is critical. Jiang's research focuses on HPC software development and applications, centering on 'cloud computing' and 'pervasive computing' integration. Jiang's goal is for faculty, staff and students to use local, private clouds for data storage and exchange.



## FACULTY & STUDENT OPPORTUNITIES

Koizumi's research involves predicting and simulating the movement of particles. His studies include very large amounts of data. "Currently," Koizumi said, "a lot of approximation is done with regard to predicting the properties of particles, but details are better. With details, we can get a more precise solution." Researchers are pleased with possible shortened calculation times, as HPC could reduce certain particulate calculations from a year to a day.

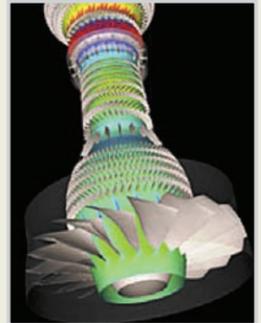
Koizumi also emphasizes the importance of HPC capabilities on students' exposure to cutting-edge research, thus greatly enhancing graduate-program and marketplace competitiveness.

Zhou's research explores the optimal design of experiments, with applications in areas like engineering, chemistry and business. One of his students works with HPC resource management and programming, an area known by only two or three percent of researchers. Other students want to gain first-hand understanding of research and cutting-edge technology.

## LOOKING FORWARD

John Pratte, interim dean for the College of Sciences and Mathematics, summed up the future for collaboration and research. "This system allows scientists, mathematicians and engineers to study a wide range of problems that are vitally important to both our community and the world at large in a shared environment that maximizes resources."

The HPC platform at ASU is making a significant impact and will continue to do so as more people at ASU and beyond become aware of the transformative possibilities this technology provides.



High performance computing has applications in diverse environments, like physics and biosciences, engineering, medical imaging, virtual reality, data mining and collaborative work settings.

**"Researchers are pleased with possible shortened calculation times, as HPC could reduce certain particulate calculations from a year to a day."**



For more information and to watch an ASU-produced video, scan this QR code with your smart phone.

## "CI-DAYS" AT ASU

As part of the CI-TRAIN agreement, partner institutions take turns hosting Cyberinfrastructure Days (CI-DAYS) to present innovations, disseminate knowledge about cyberinfrastructure and bring together a variety of interested parties. ASU's CI-DAYS for Transformational Scientific Discovery were held on Oct. 30-31, 2011.

Innovations in several areas were presented:

- 1 "Medical Animation," presented by Robert Krensel, Marketing vice president of XVIVO, one of the first companies to focus solely on the development of customized medical and scientific 3D animation.
- 2 "Global Climate Modeling," presented by James B. (Trey) White III, software engineer at the National Center for Atmospheric Research.

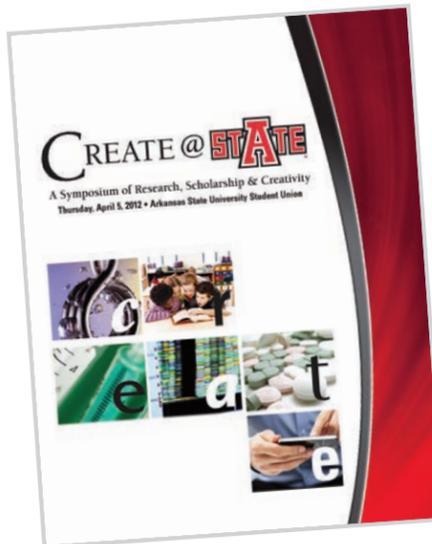
- 3 "Rome Reborn," presented by Bernard Frischer, director of the Virtual World Heritage Laboratory, an international initiative whose goal was the creation of 3D digital models illustrating the urban development of Ancient Rome.



2012  
2nd Annual!

# CREATE @ STATE

A Symposium of Research, Scholarship & Creativity



*Create @ STATE: A Symposium of Research, Scholarship & Creativity is an annual event dedicated to the celebration of research, scholarship and creativity by students at Arkansas State University. It is an opportunity for both undergraduate and graduate students in all disciplines to showcase their accomplishments through the traditional academic mechanisms of poster presentations, oral presentations and creative performance. Faculty members across the ASU campus serve on the Advisory Board, as mentors to student presenters, and as judges, room hosts and enthusiastic audience members.*

Cover of the 2nd annual publication for Create @ STATE: A Symposium of Research, Scholarship & Creativity

The first **Create @ STATE** took place on March 29, 2011. Nearly 150 undergraduate and graduate students presented their scholarly work by panel discussion or poster presentation during the day-long symposium and a group of students performed a Tuba and Euphonium Concert. First and second place prizes were awarded to 19 students in ten award divisions.

The second annual **Create @ STATE** was held on April 5, 2012. This time, nearly

190 undergraduate and graduate students presented their research, scholarly and creative activities. First and second place prizes were awarded to 20 students in ten award divisions. First-place students were each awarded an iPod Nano; second-place students were each awarded an iPod Shuffle; and iPad 2s were awarded to overall best poster and oral presentations.

Several students who participated in the inaugural event returned to the second

**Create @ STATE** and of note are two students who received awards both years. Muhsin Aydin won first-place division honors in 2011 and went on to win best overall poster in 2012. Aydin will graduate with his Ph.D in molecular biosciences in August 2013. Originally from Turkey, Aydin arrived in Jonesboro in 2008 with a master's degree in biochemistry and no English language skills. After spending his first year in ASU's English as a Second Language program, he began to work on food science research. Aydin emphasized that presenting at **Create @ STATE** provided the necessary preparation for his professional conference presentations, such as the International Food Technologists Annual Meeting in Las Vegas, Nevada. Aydin believes the extra edge **Create @ STATE** gives students is what encourages them to "work a little harder and study a little more" than they otherwise might.

Likewise, Brittany Bailey was awarded top division honors in 2011 and went on to receive best overall oral presentation in 2012.

Bailey originally entered **Create @ STATE** to network with other ASU student researchers. She graduated with her bachelor's degree in May 2012 and matriculated into the communication sciences and disorders Ph.D program at the University of Arkansas for Medical Sciences. Like Aydin, Bailey emphasized the importance of gaining presentation experience at her home institution before presenting in professional venues. Bailey also noted that her positive experience at the 2011 **Create @ STATE** motivated her to continue her project and take it to the next level.

**Create @ STATE** student participation, coupled with meaningful faculty support, continues to bolster the ever-increasing research culture at ASU. Also, the ASU community's overwhelmingly positive regard for the event further highlights the accomplishments and abilities of ASU undergraduate and graduate students. The third **Create @ STATE** is planned for Thursday, April 11, 2013, in the ASU Student Union.



ASU students from all disciplines participate in the day's events.

## 2012 Create @ STATE Best Overall Undergraduate Oral Presentation



**Brittany Bailey**  
**Undergraduate Communication Disorders Major**

***A Preliminary Investigation of Potential Subtle Middle-Ear Differences in Children with Reading Delays***

This investigation examined possible subtle middle ear differences between children that were above- and below-average readers. Participants ranging from kindergarten through third grade were ranked according to percentile reading scores. Children were assigned to one of two groups, with one group representing the lower quartile and one group the upper quartile. Participants had no significant history of ear infections, middle-ear disorders, or suspected hearing loss. Middle-ear function assessment included measures of external ear canal volume, middle-ear compliance, and middle-ear pressures. An independent t-test between mean right middle-ear pressures was significant. Implications for this finding, as well as recommendations for future study, will be discussed.

Faculty Mentor: Dr. D. Mike McDaniel, Communication Disorders



Scan this QR code with your smart phone to find out more about **Create @ STATE**.

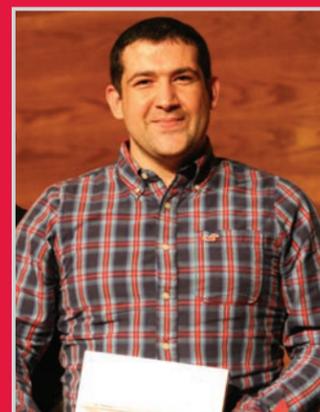
## 2012 Create @ STATE Poster Presentation Winners



| <i>Science, Technology, Engineering and Mathematics - Undergraduate</i> |                    |   |                           |
|---|--------------------|---|---------------------------|
| 2nd Place   | Jonathan Radin     | Effects of Exogenously Applied Abscisic Acid in Modulating Foliar Ascorbate Content in Arabidopsis Thaliana                                 | Chemistry                 |
| 1st Place   | Edith Martinez     | Drought Forecast in Northeast Arkansas  | Civil Engineering         |
| <i>Science, Technology, Engineering and Mathematics - Graduate</i>      |                    |   |                           |
| 2nd Place   | Swapnali Halder    | Characterizing Long-term Voluntary Nicotine Consumption: The Relationship Among Solution Concentration, Estrous Cyclicity and Sera Cotinine | Molecular Biosciences     |
| 1st Place   | Walter Acosta      | Plant-Made Pharmaceuticals RTB Fusions as a Novel Strategy for Delivering Lysosomal Enzyme Therapeutics into Mammalian Cells                | Molecular Biosciences     |
| <i>Social and Behavioral Sciences - Undergraduate</i>                   |                    |   |                           |
| 2nd Place   | Lauren Tyler       | Developing and Using General Education Block Exams  | Psychology                |
| 1st Place   | Christopher Parham | Reliability of Rubrics used in Music Assessment   | Psychology                |
| <i>Social and Behavioral Sciences - Graduate</i>                        |                    |   |                           |
| 2nd Place   | Amanda Burrow      | Scared Sober? Evaluating the Effectiveness of Drug Prevention Messages Over Time  | Mental Health Counseling  |
| 1st Place   | Melody Mooney      | Reading Levels of Healthcare Textbooks and Student Reading Levels in a Physical Therapist Assistant Program                                 | Reading                   |
| <i>Nursing and Health Professions Undergraduate</i>                     |                    |   |                           |
| 2nd Place   | Marissa Watson     | Reality of Domestic Abuse in Jonesboro  | Social Work               |
| 1st Place   | Ashley Chasteen    | The Effects of Hippotherapy on Motor Performance In Individuals with Disabilities   | Interdisciplinary Studies |
| <i>Nursing and Health Professions Graduate</i>                          |                    |   |                           |
| 2nd Place   | Chris Enger        | Description of Predisposing Factors Associated with Shoulder Pathology in Age Group Swimmers.   | Physical Therapy          |
| 1st Place   | Manette Keller     | The Impact of a Structured Exercise Program on Health and Functional Performance Parameters on a Cohort of Obese Children                   | Physical Therapy          |

ASU students present research findings through poster presentations.

## 2012 Create @ STATE Best Overall Graduate Poster Presentation



**Muhsin Aydin**  
**Graduate Student in Molecular Biosciences**  
*Detection and Genetic Characterization of Salmonella by Bead-Based Suspension Flow Cytometry*

## 2012 Create @ STATE Oral Presentation Winners



| <i>Science, Technology, Engineering and Mathematics - Undergraduate</i> |                |  |                       |
|---|----------------|--|-----------------------|
| 2nd Place   | Chenoa Summers | Gluons from Color Glass Condensate Collisions  | Physics               |
| 1st Place   | Jon Calhoun    | Construction and Classification of Generalized Minimum Aberration Designs of Hadamard Matrices on a Graphics Processing Unit | Computer Science      |
| <i>Science, Technology, Engineering and Mathematics - Graduate</i>      |                |  |                       |
| 2nd Place   | Kelsea Cox     | Constructing Nonregular Robust Parameter Designs for Quality Improvement   | Mathematics           |
| 1st Place   | Jose Tovar     | Bioproduction of a Thermostable Enzyme for Processing Arkansas Sugar Beets   | Molecular Biosciences |
| <i>Social and Behavioral Sciences - Undergraduate</i>                   |                |  |                       |
| 2nd Place   | Alana Holland  | Russian Literature after Perestroika: The Historical Context for the Departure from Tradition                                | History               |
| 1st Place   | Neena Viel     | Educational Narratives of At-Risk Students   | Communication Studies |
| <i>Social and Behavioral Sciences - Graduate</i>                        |                |  |                       |
| 2nd Place   | Yuko Mizuuchi  | Employee's Work Motivation in Japanese Fitness Clubs   | Sports Administration |
| 1st Place   | Teri Spillman  | A Tale of Two Twins: The Need for Systematic and Explicit Instruction in Kindergarten  | Reading               |
| <i>BEST OVERALL UNDERGRADUATE POSTER PRESENTATION WINNER</i>            |                |  |                       |
|   | Jessica Bailey | Development of an In Vitro Assay to Evaluate Uptake of Human Glucocerebrosidase into Mammalian Cells                         | Biology               |
| <i>BEST OVERALL GRADUATE ORAL PRESENTATION WINNER</i>                   |                |  |                       |
|   | Amber Strother | Writing a New Mestiza: Identity Formation in Sandra Cisneros's The House on Mango Street and Woman Hollering Creek           | English               |

ASU students present compelling oral presentations.

Salmonella is the leading cause of foodborne illnesses in the United States. Recent outbreaks associated with Salmonella-contaminated foods and related economic loss show the importance of timely control of this harmful pathogen. This study developed a sensitive, rapid and specific bead-based suspension array to detect and identify Salmonella serotypes by identifying their characteristics. In this study, bead-based suspension array of high multiplexing ability was coupled with PCR amplification to detect Salmonella with high sensitivity and specificity. Mixtures of seven types of beads, each functionalized with a different oligonucleotide probe designed from Salmonella genes, were used as a bead-suspension array platform for detection of Salmonella using DNA hybridization.

*Faculty Mentor:* Dr. David Gilmore, Biological Sciences  
*Other Authors:* Dr. David F. Gilmore; Clayton Preston, Biology; Jackie Carter, Chemistry and Dr. Soohyoun Ahn, Food Science and Human Nutrition, University of Florida



Andrew Sustich

Friends:

I hope this edition of **MEASURE**® helped you gain a deeper understanding of the many ways ASU's scholarly activities impact the local and broader economy. We are proud of the innovation and drive of our faculty, staff and students, who are leading us into the future. In research administration, we appreciate our unique perspective gained through supporting the variety and magnitude of intellect, discovery and creativity taking shape across campus. We created **MEASURE**® to share that perspective with you.

The Office of Research & Technology Transfer is committed to supporting discovery and innovation through additional research initiatives such as **Create @ STATE**, our in-depth grant writing program, Institute for Research Development, other ongoing research development sessions and support of new centers of excellence, to name a few.

On behalf of the Office of Research & Technology Transfer, along with ASU's artists, scholars and researchers, we extend our deepest appreciation to you. Thank you for taking the time to read this issue; we look forward to sharing the next edition with you.

Best regards,

Andrew T. Sustich, Ph.D.  
Associate Vice Chancellor for Research & Technology Transfer

# MEASURE

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