

MEASURE

THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY



FALL 2011

SUSTAINABILITY:

ENVIRONMENTAL
EDUCATIONAL
ECONOMIC
CULTURAL



DISCOVERIES TO CHANGE OUR WORLD

WHAT IS MEASURE[©]?

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[©] 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 : the measure of success

MEASURE

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SUSTAINABILITY



DISCOVERIES TO CHANGE OUR WORLD

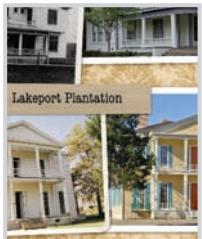
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Childhood Services programs are funded wholly or in part by the Arkansas Department of Human Services and Division of Child Care and Early Childhood Education.



Dan Howard



Glen Jones

Ladies and Gentlemen:

We are delighted to present this inaugural edition of **MEASURE : THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY[©]**, which will be produced and distributed annually. This publication stemmed from the growing importance of sponsored activities on our campus as ASU transitions from being a comprehensive, regional institution to a research-intensive university in conjunction with its new role and scope. In this and other ways, we intend to highlight some of the important research and outstanding service programs at ASU, as well as the researchers and directors involved.

In this issue, we focused on programs that are representative of the breadth of the university and asked the researchers and program leaders to tell their stories. With enthusiasm we introduce you to the leaders from Childhood Services, Arkansas Heritage Sites, the Center for Efficient and Sustainable Use of Resources (CESUR) and Plant-Powered Production (P3). They compellingly describe the importance of their work and the vision for moving their agendas forward.

We hope you enjoy this edition of **MEASURE[©]** and look forward to receiving your feedback!

Warmest regards,

A handwritten signature in red ink that reads "G. Daniel Howard".

G. Daniel Howard
Interim Chancellor

A handwritten signature in red ink that reads "Glendell Jones, Jr.".

A second, fainter signature "Glendell Jones, Jr." is visible below the first one.

Glendell Jones, Jr.
Interim Academic Vice Chancellor and Provost



Mike Dockter

Welcome to the premier edition of **MEASURE : THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY**®, an annual publication dedicated to scholarship and creativity at Arkansas State University! In the last five years, the university increasingly emphasized research, thus increasing sponsored program awards and expenditures almost 2.5 times.

Increased emphasis on scholarly activity was prompted by the growing realization that student experiences are richest when teaching and scholarship are entwined. Rollin Tusalem, Assistant Professor in Political Science and recent recipient of the university's Excellence in Research & Scholarship Award, eloquently spoke of this phenomenon in his keynote address (excerpted in this issue) to students, faculty, and staff at the inaugural student research day coined **Create @ STATE** held in the spring of 2011. Additionally, following the release of the *Opportunities for Advancing Job Creating Research in Arkansas: A Strategic Assessment of Arkansas' University and Government Lab Research Base* (Battelle Technology Practice, April 2009), Governor Mike Beebe challenged the university to increase its research activity as a means of fueling the local economy.

In this issue, you will find articles that cover the scholarship spectrum at ASU, including:

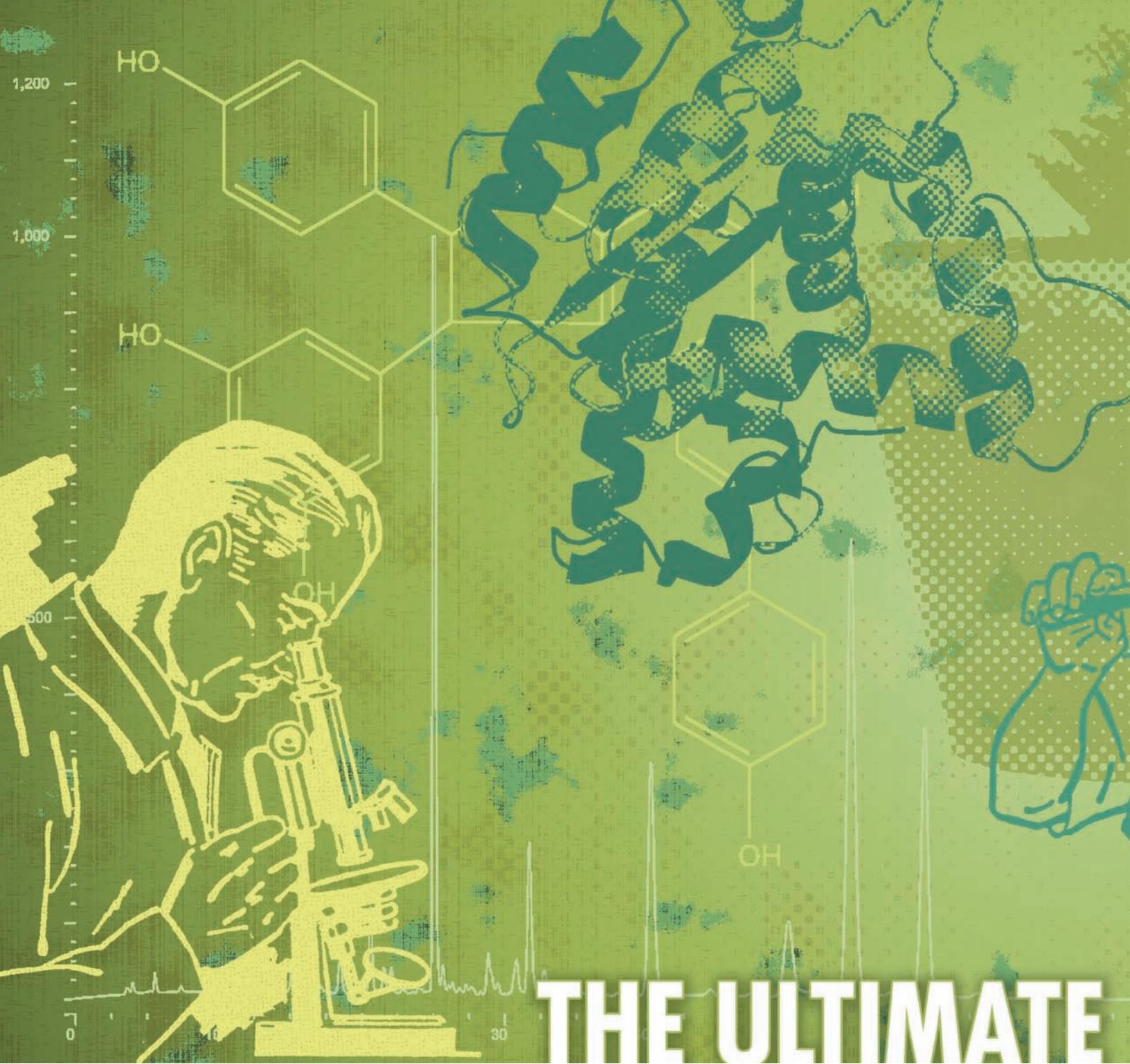
- P3, a project that utilizes plants as production factories for biologically important compounds;
- the CESUR Project, an interdisciplinary center for research and renewable resources;
- the Arkansas Heritage Sites, a program preserving the heritage of the region and;
- Childhood Services, an expansive and innovative program that improves the quality of early childhood education.

These articles are indicative of the facultys' creativity and passion in creating new research and service opportunities and providing students with expanded workforce options. In future issues, we will continue to share the broad spectrum of activities on our campus, focusing in part on the linkages between scholarship and teaching and the added value for students as the research enterprise expands.

Best regards,

A handwritten signature in red ink, appearing to read "Michael E. Dockter".

Michael E. Dockter, Ph.D.
Associate Vice Chancellor for Research and Chief Research Officer



THE ULTIMATE

The Arkansas Experimental Program to Stimulate Competitive Research (EPSCoR) Center for Plant-Powered Production (P3) is a stellar example of Arkansas' investment in plant-based bioproduction technology. Funded by the National Science Foundation EPSCoR Program, P3 is a research partnership between Arkansas State University, University of Arkansas-Fayetteville, University of Arkansas-Little Rock, University of Arkansas-Pine Bluff, and University of



RENEWABLE RESOURCE...

Central Arkansas. P3 encompasses more than 40 faculty and previously funded collaborative start-up grants to promote understanding of the fundamental biology underlying plant-based bioproduction and to develop plants as scalable biofactories for high-value proteins, unique chemicals and renewable biomaterials. P3 is likewise focused on outreach and entrepreneurship endeavors to engender knowledge-based economic development within the State of Arkansas.





Carole Cramer

WHY PLANT RESEARCH?

"Plants are the ultimate renewable resource," says Dr. Carole Cramer, Professor of Biology and Director of the P3 Center in the Arkansas Biosciences Institute (ABI) at Arkansas State University. Departing from the traditional use of plants as food, fiber and fuel, P3 has a more radical approach: exploiting plants' synthetic capacity for producing pharmaceutical and health-promoting products.

Plants are the next generation of "smart drugs."

Plants can provide proteins and enzymes with advantages in safety, scale and cost compared to other production systems. Plants are the next generation of "smart drugs" according to Dr. Cramer. "Surprisingly, plants can efficiently synthesize human proteins. With advances in biotechnology, we can even make 'better human proteins' that enhance delivery, stability and bioactivity," says Dr. Cramer. The scientific teams will thus explore the synthesis, regulation, trafficking and storage of proteins and enzymes in plants. They also isolate these products from plants and analyze their impact on target cells and tissues. Other P3 researchers are focused on the health promoting activities of plants' smaller molecular counterparts called phytochemicals.

Dr. Fabricio Medina-Bolivar, Plant Metabolic Engineer at the Arkansas Biosciences Institute at Arkansas State University, is conducting research to demonstrate the amazing power of plants. In his research with resveratrol, a polyphenol produced naturally in plants, harnessing its healing power may lead to advances in medicine for pain management and treatments for obesity, cancer and Parkinson's disease. With one patent issued, which allows for the production of unique resveratrol derivatives using peanut root cultures, and two patents pending, Dr. Medina-Bolivar stresses the collaborative approach to research. "We cannot work alone," says Dr. Medina-Bolivar, "we must collaborate with many scientists and the P3 Center provides such opportunities." "The magic of P3 is that we are fundamentally cross-disciplinary," says Dr. Carole Cramer. P3's faculty and students have expertise in computational modeling and data mining, molecular genetics and transgenics, metabolic profiling, analytical chemistry, molecular plant pathology, bioreactor design and process scale-up, and bioactivity assessment.



Scan this QR code with your smart phone to watch an ASU produced video about P3.

PHARMACEUTICAL PROTEINS IN PLANTS — A DAUNTING TIMELINE:

Plant scientists Carole Cramer (ASU professor and P3 Center Director) and her husband, David Radin, Ph.D., had an idea in 1992 – use plants as a cost-effective alternative to make "the most expensive drug in the world." Almost 20 years later, this 'idea' may become the first commercialized plant-made pharmaceutical protein to attain FDA approval as a prescription medicine for Gaucher Disease.

Federal Small Business Innovative Research grant awarded to begin "proof-of-concept" research

1992

1993

1994

Science magazine highlighted the human enzyme glucocerebrosidase (hGC) as a remarkable but very expensive "replacement enzyme therapeutic" for patients with Gaucher Disease

Cramer and Radin proposed the human gene could be introduced into the plant and the plant could serve as a "factory" for hGC

First demonstrated that hGC made in tobacco plants is active

AN INVESTMENT FOR THE FUTURE...

P3 invests in Science, Technology, Engineering and Mathematics (STEM) outreach programs for students in grades 6 - 12. The program also offers more than 70 undergraduate summer research internships which target minority candidates and one-year stipends for more than 50 Master of Science/Ph.D. students.

P3 entrepreneurship activities, in line with the state's emphasis on economic development and commercialization, include mentoring in patenting, technology transfer, Small Business Innovation Research (SBIR) grant writing and

entrepreneurship. Thus far, Plant-Powered Production has yielded a number of completed and pending patents, and has been the impetus for a number of small business start up companies.

Ensuring a diverse workforce is as much a part of the culture of the P3 Center as cutting-edge research, outreach and entrepreneurship. The thread that ties these elements together continues to be the engagement of a diverse pool of graduate students, postdocs, visiting scientists and faculty who provide inspired leadership in this important area of discovery.



"The magic of P3 is that we are fundamentally cross-disciplinary."



Patent for plant-produced lysosomal enzymes issued

1999

Process licensed to *Protalex Therapeutics* for commercial hGC production in carrot cells

Human clinical trials began (first time in patients!)

To sum it up, Dr. Cramer says: ➤

Pfizer partnered with *Protalex* for worldwide rights to commercialization

Clinical trials showed plant-made product is safe and effective

2005

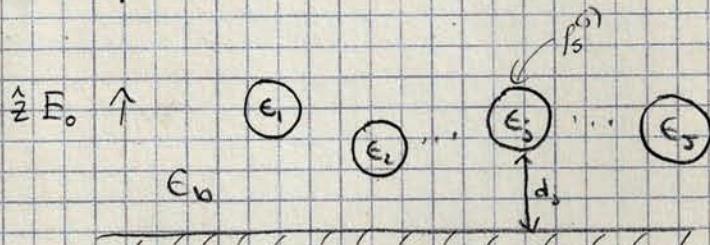
2009

2011

[Anticipated]
US Food and Drug Administration (FDA)
approves use of the plant-made drug

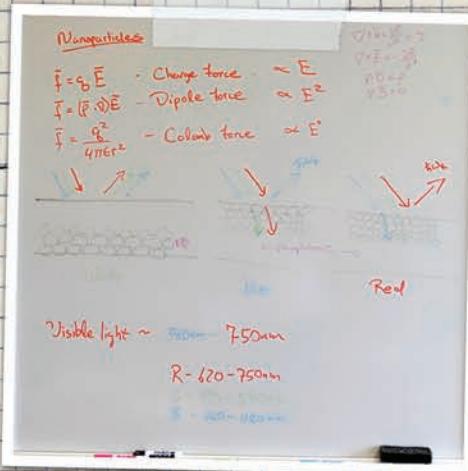
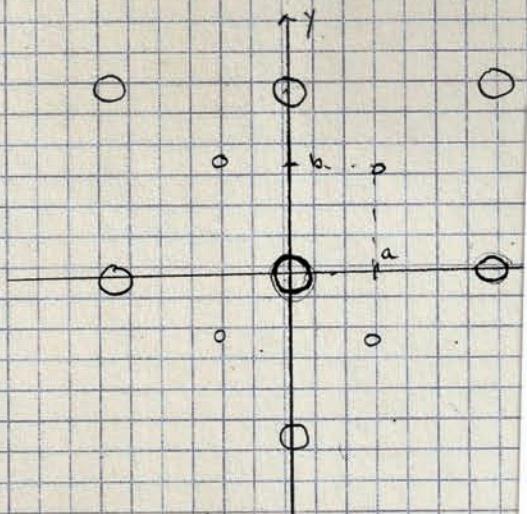
"It is a tremendous feeling to know your idea, especially one that was considered pretty crazy and risky at the time, has come to fruition and is actually in patients. This is a devastating disease and it is wonderful to know we have made a difference for these patients."

Multiple Particles in Static field



PC Charge Image Model

Intensity Map



Inputs

- $f^s(x, y)$ @ CTH/CTB boundary (Surface charge)
- Amplitude mapped from V vs E curves (Boulder)



SAMPLE

[WASTE TONER CONTAINER]

A16834-X

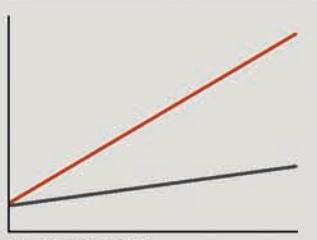
1.
Increased toner particle adhesion would reduce waste, significantly increase printer efficiency and image quality.

2.
Smaller waste toner bottle could be utilized allowing for less plastic material to be used.

NOTES



LASER PRINTER CONFIGURATION B-63



NEW RESULTS

OLD RESULTS



Hail CESUR!

Environmental Sustainability

America's great Interstate Highway System of the 1950s was a modern technological marvel. Today however, the interstate is showing its age. What do we do with a worn-out bridge or a crumbling highway when its materials can only go to the landfill? What about the country's reliance upon fossil fuels and other diminishing resources?

Thanks to an entity called CESUR at Arkansas State University, such waste may have met its match. The Center for Efficient and Sustainable Use of Resources (CESUR) is a new center of excellence established at ASU in 2010 with a \$1.4 million grant from the Arkansas Science and Technology Authority. As the name suggests, CESUR has two areas of emphasis: efficiency and sustainability.



Brandon Kemp

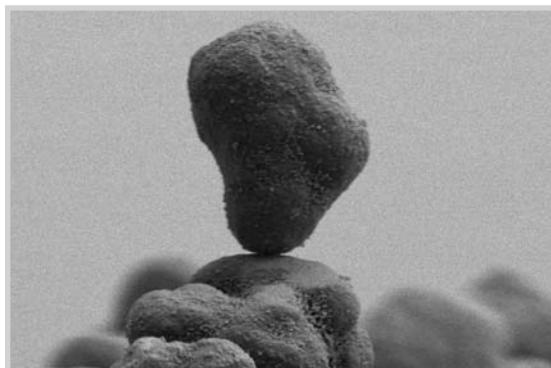
CESUR LIVES

Under the direction of Dr. David Beasley, Dean of ASU's College of Engineering, CESUR is led by a team consisting of Dr. Brandon Kemp, Assistant Professor of Electrical Engineering, inventor of five U.S. patent applications; Dr. Kwangkook Jeong, Assistant Professor of Mechanical Engineering, inventor of five Korean patents; and Dr. Ilwoo Seok, Assistant Professor of Mechanical Engineering, inventor of six Korean patents and one U.S. patent.

"Environmental sustainability . . . does not mean the environment should be unchanged, because the environment changes naturally over time whether humans have anything to do with it or not."

According to Dr. Kemp, "The CESUR faculty have research interests in improved efficiency of engineering systems, particularly in regard to minimization of

input energy and materials to achieve a specific function, which generally involves the reduction of waste. We recently finalized a research contract with a major developer and manufacturer of printing systems to provide models aimed at reducing the energy consumption and material waste in laser printing systems. We have long-term plans to expand our research collaborations with other industries and research institutes as opportunities arise."



Scanning electron microscope (SEM) picture of charged toner particle. CESUR is presently working to understand particle adhesion for efficient printing systems. Toner image from J. G. Whitney and B. A. Kemp, "Toner Adhesion Measurement," IS&T NIP 26, 229 (2010).

making the transfer

One of ASU's research goals is building economic and community resources to support regional knowledge-based industries. Technology transfer, or turning research into industry, is the key. CESUR's long-term strategy includes:



Scan this QR code with your smart phone to watch an ASU produced video about CESUR.

Toward these long-term strategies, ASU, with funding from the Department of Commerce, is developing research incubation space and support systems for startup companies. Housed in the Arkansas Biosciences Building (ABI), nearly 6,000 square feet of space is now available. Equally important, ASU is pursuing funding for an additional state-of-the-art facility that would house CESUR and other entrepreneurial programs.

ENVIRONMENTAL SUSTAINABILITY

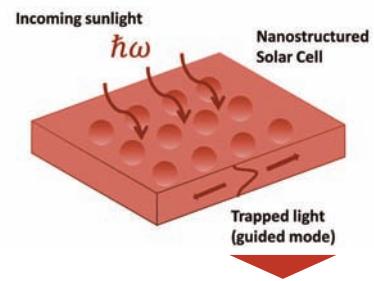
Dr. Kemp says sustainability means the ability to endure or maintain, adding "Environmental sustainability, then, refers to the ability of mankind to maintain the environment on a controlled or natural course. It does not mean the environment should be unchanged, because the environment changes naturally over time whether humans have anything to do with it or not.... The other aspect of sustainability is the control of human effects on the environment. That is obviously where engineers come in. CESUR approaches environmental sustainability by developing efficient and sustainable use of energy and materials to meet the needs of society."

Their sustainability research focuses on renewable and alternative energy, including alternative energy production via solar and wind as well as energy storage. CESUR's interest in alternative energy sources stems from the belief that we cannot sustain our rate of energy consumption in the long term unless we can replenish the sources at an equal rate. Kemp says, "Presently, there is a need to substitute consumption of fossil fuels with energy sources that are eco-friendly, manageable and sustainable."

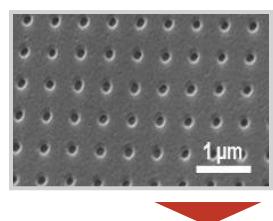
ROADS TO LANDFILL

Apart from fossil fuels, there are other issues of consumption. Today, much of the world uses heavy materials only one time. Major construction projects such as buildings, roads and bridges are utilized until they reach the end of their useful life. Then, much of the material used in that project is either landfilled or put to a lesser use.

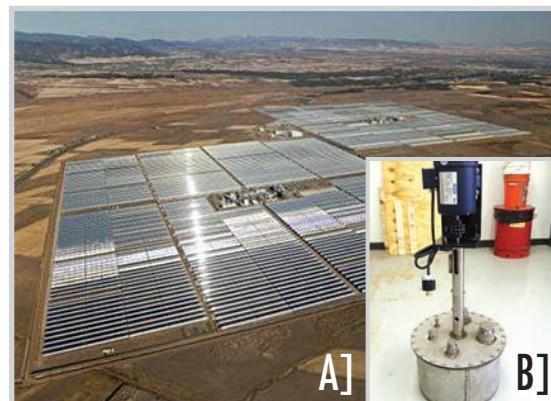
While steel and some other building materials can be separated and then recycled or reused, many other materials such as concrete, asphalt, drywall or wood are more difficult to reuse, particularly for similar purposes. Some, like asbestos, are dangerous to handle. Many, if recycled at all, are converted to less useful types of materials.



Nanostructured materials can be used to trap light in solar cells for increased sunlight absorption leading to improved efficiency.



Scanning electron microscope (SEM) picture of a nanopatterned material. CESUR faculty have expertise in nanomanufacturing and light propagation.



CESUR WORK ON NOVEL MOLTEN SALTS FOR CONCENTRATING SOLAR POWER PLANTS.

A] Andasol 1 Power Plant: 50 mega-watt Andasol-1 concentrating solar power plant in Spain.

B] Power plant simulator: ASU's scaled laboratory simulator for Andasol-1 thermal energy storage tank.

- A technology-based incubator to foster entrepreneurship between both faculty and community industry;
- A facility to house the academic training site for entrepreneurship and innovation programs;
- A permanent home for the Center of Excellence in Environmental Sustainability and other high-tech companies;
- A research and commercialization park to include collaborative personnel from ASU's Office of Research and Technology Transfer, Delta Center for Economic Development and the Arkansas Biosciences Institute.

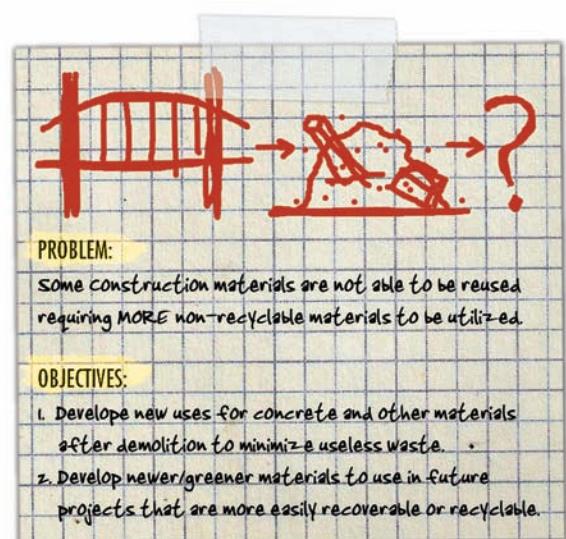
This generally means those “lesser” materials must be used nearby since their diminished value does not justify spending a great deal on transportation. Quite often, this simply leads to a decision against recycling. Further, because those materials are not reused for their original purpose means new wood, cement or asphalt must be utilized for new projects.

“Faculty at ASU are using their research capabilities . . . to develop new, ‘greener’ materials for a wide range of applications.”

Some building materials are not recoverable. However, materials could be created, which could be more easily recovered. Similarly, materials not now recoverable or recyclable could be salvaged through innovative technology.

Faculty in both the Colleges of Engineering and Sciences & Mathematics at ASU have research capabilities in construction material development and testing. CESUR assembles those capabilities into a

functional unit to work with industry, government and academia to develop new, “greener” materials for a wide range of applications. Initial areas of concentration will be on materials that are renewable, bio-based resources as well as on new substances that can be created from recycling other materials such as those recovered from construction or paving.



CESUR is also promoting sustainability through the development of new materials that would be more easily recovered from major building projects when they reach the end of their life. Materials not now recoverable or recyclable could be salvaged through innovative technology.

ACADEMIC ENRICHMENT AND ECONOMIC IMPACT

In line with its academic role, ASU has developed and is developing degree programs to support CESUR’s research, workforce and business development goals. These include doctoral programs in environmental sciences and in molecular sciences, plus graduate program development not only in engineering but also in entrepreneurship. Thus, in addition to developing programs that address the areas of novel recyclable materials, energy efficiency and environmental sustainability, CESUR is poised to develop and nurture a technically proficient workforce – a key component for regional economic development.

Says Kemp, “Our long term goals include generation of intellectual property in efficiency and sustainability of engineering systems and the establishment of a nationally competitive graduate program in the College of Engineering, which we expect will have a positive impact on the workforce and economy of the region.”

CESUR's FRIENDS

In the quest for a more sustainable tomorrow, CESUR has a lot of allies. Participants at ASU alone include the Colleges of Agriculture & Technology, Business, Education, Engineering and Sciences & Mathematics. The Arkansas Biosciences Institute (ABI) and the Office of Research and Technology Transfer on campus are important partners in making the leap from the lab to the marketplace, as are the Delta Center for Economic Development, the ASU Research and Development Institute and the Arkansas Biosciences Institute Commercial Innovation Center.

CESUR's work will be further leveraged with existing resources and programs already under development at ASU including:

- Faculty working in the areas of foci;
- Pertinent graduate programs;
- Research and development partnerships with governmental agencies and large Northeast Arkansas companies such as Nordex and Nice-Pak;
- Development of technology transfer and economic development expertise to create knowledge-based jobs; and
- Advanced plans to generate federal funds for new research and technology transfer space for CESUR and other similar programs.

In time, CESUR is expected to become self-sustaining through competitive funding, returning the state's investment many times over. More importantly, CESUR's work will contribute to the growing body of knowledge regarding environmental sustainability, provide opportunities for students as they seek careers in the sustainability industry, and provide economic stimuli to the area while simultaneously fueling economic growth in the region.

In the quest for a more sustainable tomorrow, CESUR has a lot of allies . . . on campus who are important partners in making the leap from the lab to the marketplace.

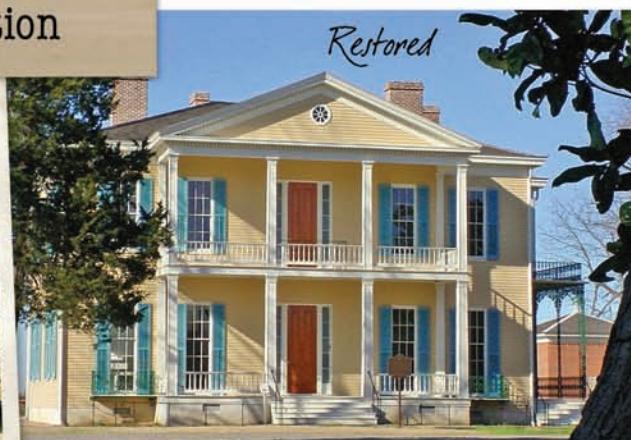
If These Walls Could Talk...

Hemingway-Pfeiffer
Museum and Educational Center



Restored

Lakeport Plantation



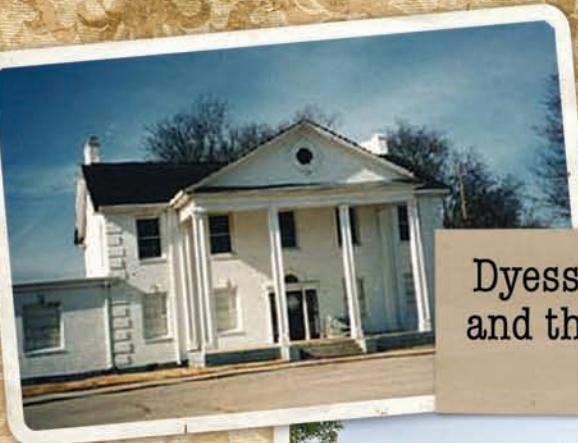
Restored

Cultural Sustainability in the Delta

If anyone could define cultural sustainability, it would be Dr. Ruth Hawkins, Director of the Arkansas Heritage Sites at ASU-Jonesboro. In her tenure as Director, Hawkins has spearheaded preservation of the cultural heritage of the Great River Road of Crowley's Ridge, the Hemingway-Pfeiffer Museum and Educational Center, the Lakeport Plantation, the Southern Tenant Farmers Museum, the Dyess Community and the Rohwer Japanese-American Relocation Center,



Southern Tenant
Farmers Museum



Dyess Colony Administration Building
and the boyhood home of Johnny Cash
in Dyess, Arkansas



Coming
Soon!

among others – all remnants of the Delta's rich cultural history. Her projects exemplify the many faces of cultural sustainability by preserving and interpreting the structures, music, art and way of life of a bygone era. They likewise encompass the three missions of the university by providing rich opportunities for instruction, research and service to the community. Equally important, the projects have played a vital part in the economic development of the Arkansas Delta.



Ruth Hawkins

"In all our restoration projects,

MAKING A BIG IMPACT

"Since our office was established 12 years ago, we have generated more than \$19 million in grant funds for sustainable cultural heritage projects in the Arkansas Delta region. Even those who never set foot in any of these heritage sites will benefit from the economic and educational benefits that these sites bring to the region," according to Dr. Hawkins.



LEARNING FROM THE PAST

Hawkins says while she and her colleagues are interested in all areas of cultural and historic preservation, they primarily focus on nationally significant projects. "Typically these projects involve stories that may not be widely known or may have been forgotten because some or all of those who experienced them directly are no longer with us," she says. "Our work at historic sites usually involves two steps: preservation of historic structures, because often these are the only remaining artifacts associated with the story and can serve as the envelope in which we place the story, and research to understand

all aspects of the story and find ways to present it so current and future generations can understand and learn from the past."

She adds, "In all our restoration projects, our interest has been in making sure the building will be sustained into the future. We have attempted to serve as a best-practices model for preservation projects around the country. For example, we designed an HVAC system for the Lakeport Plantation that is more focused on the 'comfort' of the house, rather than the people in the house, and it reacts primarily to humidity levels, rather than temperature levels, to keep the house in balance. The project also includes a geo-thermal field with 30 wells to assist in heating and cooling. We have utilized state-of-the-art techniques in all aspects of our restorations, such as dendrochronology (tree-ring dating) to date structures, microscopic analysis for paint history and ground-penetrating radar for archeology work. In researching the stories, we have utilized a variety of techniques, including conducting oral history interviews, researching court records and government documents, going

"The biggest project yet will essentially involve the restoration of an entire community."



Scan this QR code with your smart phone to watch an ASU produced video about Arkansas Heritage Sites.

THE ECONOMIC BENEFIT:

There are several major benefits that Arkansas' Heritage Sites provide. Culturally, the sites preserve nationally/internationally important aspects of the state's heritage that might otherwise be lost. Economically, Arkansas Heritage Sites serve as catalysts for job creation and tourism income to impoverished parts of the Arkansas Delta.

Hemingway-Pfeiffer Museum and Educational Center

In the 11 years since opening the Hemingway-Pfeiffer Museum, annual travel-related expenditures in Clay County have increased by 56%. Annual travel-related jobs are up by 11% and visitorship has increased by 18%.

(Based on 2010 Ark. Dept. of Parks and Tourism annual report)

our interest has been in making sure the building will be sustained into the future."

through family and/or organizational records, and so forth."

LIVING LABORATORIES

ASU has involved its students in the Heritage Studies Ph.D. program every step of the way, using its field sites as living laboratories. Currently the university owns and operates three heritage sites:

- Hemingway-Pfeiffer Museum and Educational Center at Piggott
- Southern Tenant Farmers Museum at Tyronza
- Lakeport Plantation at Lake Village

Now the Arkansas Heritage Sites office is undertaking the biggest project yet: restoration of the Johnny Cash boyhood home and the Federal Administration Building in the historic Dyess Colony. This agricultural resettlement community employed out-of-work farmers during the Great Depression. The Cash family moved to the Dyess Colony in 1935, when Johnny was three years old, as one of the earliest colonist families. "We are collaborating with

the Cash family and the City of Dyess on a master redevelopment plan for the community that involves both the Cash legacy and the New Deal-era heritage," Hawkins said. "It will essentially involve the restoration of an entire community, and that will be huge in terms of its importance to educational programming and economic development for the region."

Often we visit a special place and speculate, "If these walls could talk..." Thanks to the cultural sustainability programs at Arkansas State University, walls are not only talking, they galvanize teaching, research, community service and economic development. And what they are saying will echo through time as we preserve their stories for generations to come.



Southern Tenant Farmers Museum

In the four years since opening the Southern Tenant Farmers Museum, annual travel-related expenditures in Poinsett County have increased by 29%. Jobs are up by 2.4% and visitorship has increased by 17%.

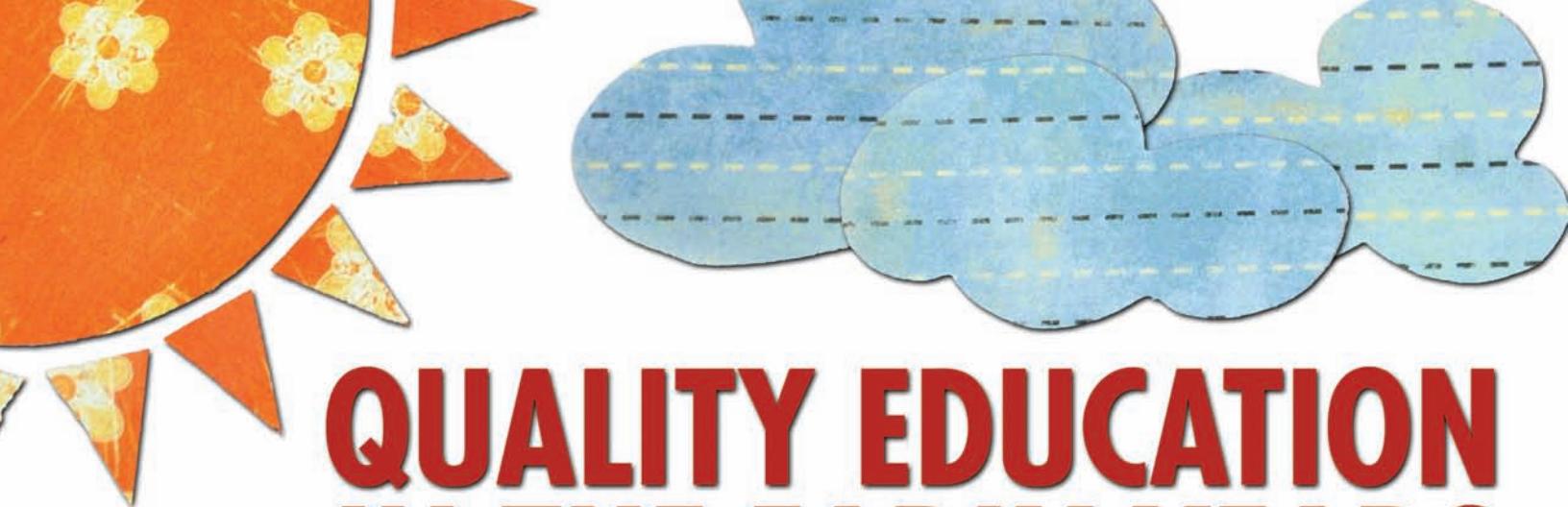
(Based on 2010 Ark. Dept. of Parks and Tourism annual report)

Lakeport Plantation

In the three years since opening the Lakeport Plantation on a limited basis, annual travel-related expenditures in Chicot County have increased by 10%. Jobs are up by 4% and visitorship has increased by 3.8%.

(Based on 2010 Ark. Dept. of Parks and Tourism annual report)

Within five years of opening, the Dyess Colony restoration is projected to generate \$300,000, with a conservative estimate of 30,000 visitors annually, through ticket sales alone. Based on the current state average expenditure of \$239.49 per visitor per trip, this could mean a total of \$7.19 million annually for the region.



QUALITY EDUCATION IN THE EARLY YEARS





JoAnn Nalley

"Studies show high quality early childhood experiences produce lifelong benefits: higher test scores, reduced need for remediation, lower rates of juvenile crime, increased graduation rates, participation in higher education, higher earnings and reduced need for social services."

Since the introduction of Head Start in the 1960s, Arkansas State University has played a vital role in the development of quality early childhood education training and resource coordination. As the Director of ASU Childhood Services, the community service outreach center of ASU-Jonesboro's College of Education, JoAnn Nalley spends the majority of her time on the road, criss-crossing the state in support of early childhood education initiatives. "Our mission is to promote excellence in early care and education. The members of the ASU Childhood Services staff represent a wide spectrum of professional knowledge and expertise. We want to help (providers) find answers and solutions that will assist in improving and sustaining the quality of their programs," explains Ms. Nalley.

The staff is charged with meeting special professional development needs of early childhood educators that cannot always be met by the typical university curriculum. These needs include staff development, workshops for parents, program assessment and assistance for licensed early education programs throughout the state. Diana Courson, Childhood Services Associate Director, says, "Experiences in a child's first eight years lay the foundation for success in school and in life. Abilities and dispositions

such as self-regulation and curiosity enable the child to focus, solve problems and interact with people and the world. Studies show high quality early childhood experiences produce lifelong benefits: higher test scores, reduced need for remediation, lower rates of juvenile crime, increased graduation rates, participation in higher education, higher earnings and reduced need for social services. The key to these benefits is high-quality early childhood experiences."

ASU Childhood Services administers pre-K centers in Northeast Arkansas as well as the Child Development and Research Center located on the ASU campus. Courson explains, "We focus on fostering a positive early educational experience. Positive experiences create positive connections and resilience. These essential experiences are necessary for optimal brain growth and development."

Parental support and involvement are also critical to the program. Childhood Services partners with parents to create a positive, joyful learning environment by providing them with continuing education opportunities in child development and early education. ASU Childhood Services Quality Institute for Resource and Referral Education (ACQUIRE), a child care

"Our mission is to promote excellence in early care and education."



resource and referral agency administered by Childhood Services, likewise assists parents in making informed choices about their children's care. Such resources include how to identify high quality child care, what to look for and how to make sure the child care is a good fit for the family.

In addition to operation of childcare centers, Childhood Services provides training services to teachers and administrators in child development centers and summer programs, many of whom may be in rural areas far from other resources. Childhood Services provided technical assistance to all 75 counties in Arkansas and also provided on-site training in 57 of those counties in 2010. Workshops, seminars, conferences and online courses are available for educators on subjects ranging from early literacy, to math and science, to health and safety in the classroom. Administrators of children's programs may select from a wide range of topics such as fiscal management, human resource development and facilities operation.

Recognizing the importance of provider linkages, Childhood Services assisted in developing and now administers the Traveling Arkansas' Professional Pathways (TAPP), a statewide practitioner registry that records and tracks training for administrators and staff, verifies trainer qualifications and compiles

outcome data. Among its capabilities, TAPP provides inter-institutional communication mechanisms via electronic and social media, promotes networking with other professionals in the field and documents education and professional development of each practitioner in a uniform method.

ASU's Childhood Services is recognized statewide for its excellence and has been awarded numerous grants from agencies such as the Department of Human Services (DHS), Division of Child Care and Early Childhood Education, Arkansas Department of Education and the Mott Foundation. Nalley and her team work tirelessly to secure funding for the multitude of programs and provider training sessions offered each year (an astounding 1,300 training sessions in 2010). Most importantly, the Childhood Services team serves countless numbers of children and has broken new ground in child development and care.



Scan this QR code with your smart phone to find out more about ASU Childhood Services.

By the numbers in 2010:

Number of Arkansas counties served by CHS: — 75

Professional development sessions offered by CHS: — 1,348

Number of people trained by CHS: — 22,581

Number of professional development hours by CHS: — 116,177

MEASURE

THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY

FUNDING TRENDS

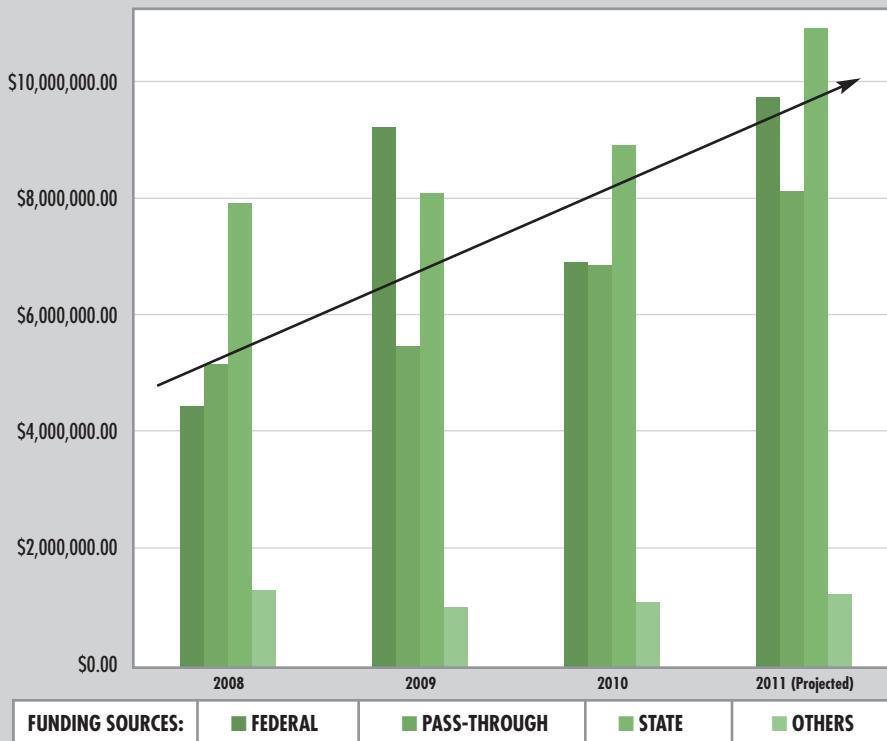


SPONSORED AWARDS & EXPENDITURES

SPONSORED AWARDS TRENDS

From FY 2008 to FY 2011, ASU's sponsored program productivity increased significantly with the dollar value of awards increasing approximately four fold (from \$7.4 million in FY '08 to \$30.2 million in FY 2011) and expenditures increasing 1.6 fold. Awards and expenditure data shown in these pages reflect a healthy balance between grants, contracts and appropriations, as well as diversity in funding sources; e.g., federal, pass-through, state, etc.

expenditures by funding source

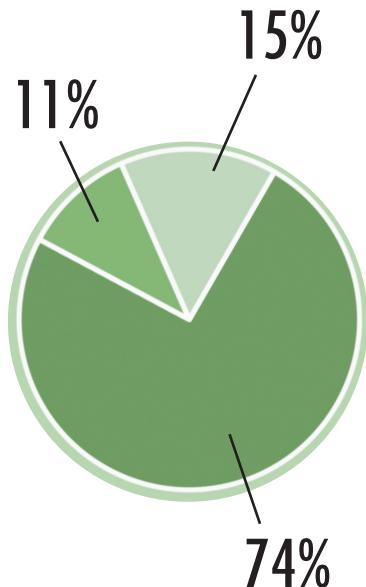


TOTAL EXPENDITURES:

2008.....	\$19,210,945
2009.....	\$24,111,714
2010.....	\$23,368,479
2011 (projected)*	\$30,023,620

2011 awards by award type

- Grant
- Contract
- Appropriation

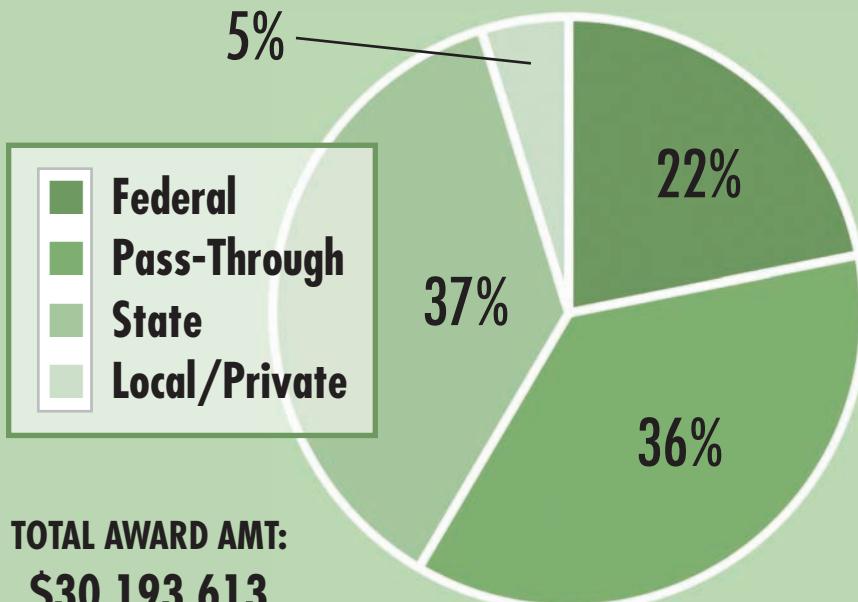


**TOTAL AWARD AMT:
\$30,193,613**



SPONSORED AWARDS TRENDS

2011 awards by funding source



TOTAL F&As: (FACILITIES & ADMINISTRATION)

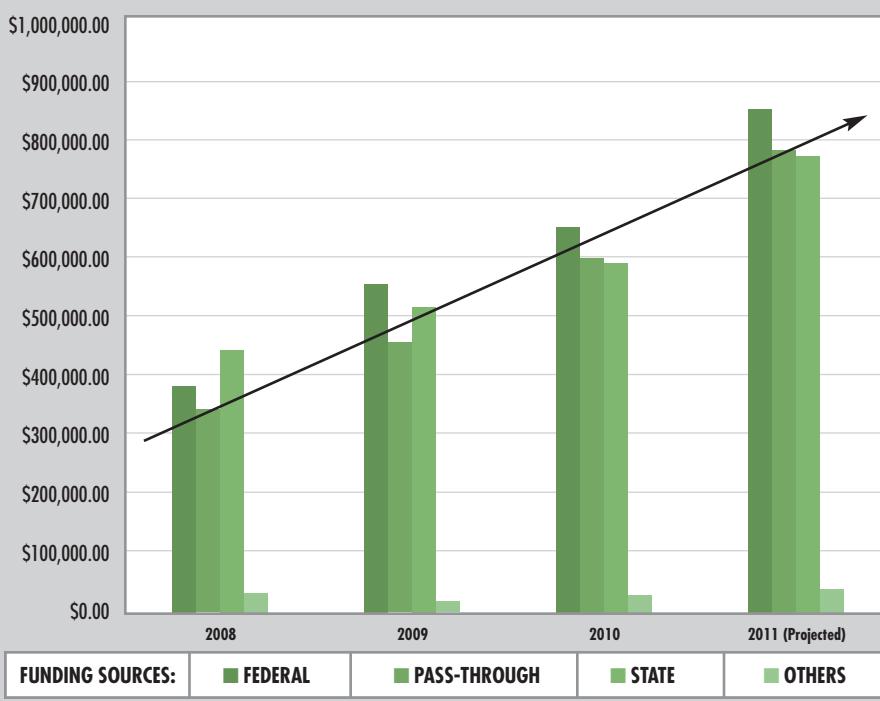
2008	\$1,197,794
2009	\$1,559,356
2010	\$1,885,240
2011 (projected*).....	\$2,450,812

F&As at Work

This list of initiatives and events directly reflects ORTT's commitment to research development.

- Create @ STATE: A Symposium of Research & Scholarship
- MEASURE: The Research Publication of Arkansas State University
- The Summer Institute for Research Development
- Seed funding for Centers of Excellence
- Matching funds and supplemental support for Student Undergraduate Research Fellowships
- Undergraduate Student Research Travel
- Graduate Student Research Travel
- Faculty Research Travel
- Faculty Reassigned Time
- Faculty Research Awards
- Intellectual Property Services
- Faculty Research Development (e.g. workshop speakers, webinars)
- IDC distribution to underrepresented or non-earning colleges

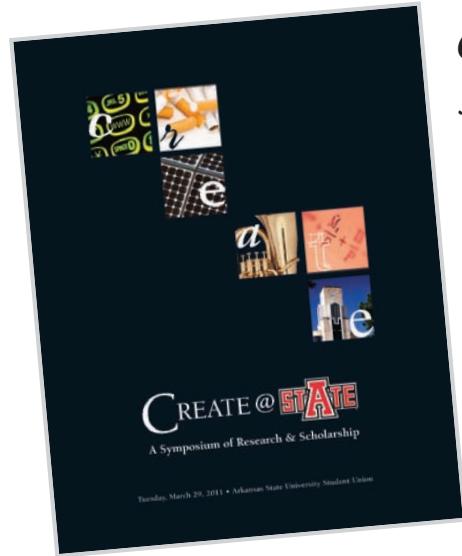
facilities & administration (F&A) by funding source



**2011
inaugural
event!**

CREATE @ STATE™

A Symposium of Research & Scholarship



Cover of the inaugural publication for Create @ STATE:
A Symposium of Research & Scholarship

Excerpt from Rollin's keynote speech given at Create @ STATE

I am thrilled to be working at Arkansas State University as we move from being a regional comprehensive university to a Carnegie-classified research-intensive institution. Research is a very important endeavor that is key to the survivability of higher education in the United States. Most academics today realize the importance of developing new theories and paradigms that impact our everyday life – may it be discovering a cure for life-threatening diseases, enhancing alert systems that can predict natural disasters and avert mass sufferings, or discovering policy initiatives that can mitigate ethnic conflict, the propensity of inter-state war, and the scourge of poverty. Most academics, when all is said and done, want to have an impact and presence. That's why many professors here at ASU spend inordinate amounts of time drafting proposals for NSF, NEH and NIH grants that bring national recognition and respect for our university. More often than not, we get rejected and never get funding, but we persevere and never give up. We face rejections with optimism as we work harder in hopes of getting ASU known regionally, nationally and internationally as a university that values and recognizes the central importance of

research in enhancing our university's reputation. Our research influences debates; our research attracts top quality MA and Doctoral students; our research links us to world leading universities and institutes; and our applied research helps shape policies and legislation.

“Teaching and research go hand-in-hand.”

There is a lot of concern among a few faculty members about how the transition will compromise the quality of teaching and the rigidity of our curriculum. However, it is important to recognize teaching and research go hand-in-hand and are inter-connected. One cannot be an effective teacher if one is relegated to regurgitating materials from a moribund, lifeless textbook. One has to engage himself and herself with conceptualizing, problematizing and operationalizing problems, and provide normative prescriptions about important questions that surround our various disciplines. If one becomes a mere spectator to ongoing debates in the field without doing research, then that defeats the



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

2010 ASU Faculty Excellence in Research & Scholarship Award Recipient

Rollin F. Tusalem, Assistant Professor of Political Science at Arkansas State University, offered the opening address for **Create @ STATE**. The ASU faculty honored Dr. Tusalem with the 2010 ASU Faculty Excellence in Research & Scholarship Award. He embodies the passion, dedication and productivity of a rising scholar. He received his doctoral degree in political science from the University of Missouri in 2008. His main areas of interest are in comparative democratization, political violence, political culture and political institutions. His work appears in the journals of *Comparative Political Studies*, *Comparative Politics*, *International Political Science Review*, *Journal of East Asian Studies* and *Taiwan Journal of Democracy*. His book titled, "*Civil Society in Transitional Democracies*," was recently published by Verlag Press. His research appears in book chapters published by Oxford University Press, Columbia University Press and Lexington Press. His article titled, "*Determinants of Coup d'État Events 1970 – 90: The Role of Property Rights Protection*," published by the *International Political Science Review* was also recently nominated for the Meisel-Laponce award sponsored by the International Political Science Association and the editors of the journal.



Rollin F. Tusalem

purpose of higher education. One has to explore various controversies, dilemmas and shortcomings of the discipline which is the only way we can sharpen analytical and critical thinking skills. Furthermore, research works its way into our teaching in a number of ways. First, some of the most highly visible and widely cited work of professors here at ASU are also the most accessible. We use our research in our teaching. We use it to explain. We use it to inform. We use it to make our students think, not just think, but think harder. Second, even when our research is complex, obtuse, convoluted and hard to comprehend, the classroom forces us to communicate complex arguments or ideas into simple language. Researching helps us synthesize and make relevant what can seem like esoteric, narrow investigations. Research helps us make our arguments clear and can even reveal faults in our research design, logic of reasoning, while we convey our percolating ideas to our students.

"Our students are at the forefront of why we do research."

The opportunity for faculty members to integrate and involve students in research is also promising. There are many opportunities for us to get involved and have our research recognized by including undergraduates and graduate students into our publishing endeavors. Our students are at the forefront of why we do research. Some students are doing work as advanced as what tenured professors do, and some help us pursue research questions we never considered. Sometimes, our students become a rich source of ideas that provide us with further motivation to investigate unanswered questions or tackle intellectual conundrums that have yet to be explored. As we shape their ideas, so can they help shape ours.

Not everyone loves to research. It is time consuming. It is laborious. It is not for the thin-skinned. It requires a lot of motivation, patience and perseverance. All we want is to make an impact and impart our knowledge to the world. Thus seeing one's name and institutional affiliation in print is well worth the effort because we want to increase the national visibility of ASU and make it world-class. Research is central to our activities, and stands alongside teaching as an equal.



ASU students and Rollin's peers listen intently as he delivers a compelling keynote speech.



Julie Thatcher

I hope **MEASURE : THE RESEARCH PUBLICATION OF ARKANSAS STATE UNIVERSITY**® helped you gain a deeper understanding of the many exciting scholarly activities here at Arkansas State University. The innovation and drive of our faculty, staff and students are leading us into the future. We are often humbled by our unique perspective of witnessing 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 initiatives such as the student research symposium **Create @ STATE**, a month-long summer grant writing program for faculty, ongoing research development sessions and support of new centers of excellence.

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,

A handwritten signature in red ink that reads "Julie Thatcher".

Julie Thatcher, Executive Editor
Director of Research Development
Office of Research & Technology Transfer

Philanthropic support is critical to helping Arkansas State University obtain a level of excellence in research not otherwise possible with funds from legislative appropriations, tuition and fees, and grants and contracts. ASU is poised to advance the quality and magnitude of research and converting research outcomes to benefit society. Please support research at ASU by making a tax-deductible contribution to the ASU Foundation by noting your program of choice on the attached donor card. Your gift will enhance research here at ASU and more widely benefit society.



Dan Howard

Thank you so very much for considering a personal contribution.

Warmest regards,

A handwritten signature in red ink that reads "G. Daniel Howard".

G. Daniel Howard
Interim Chancellor

in the next issue:



Learn why Military Times EDGE magazine designated ASU one of the top military-friendly universities in the nation for veterans. Funds donated by the Buddy G. Beck family established the Beck PRIDE (Personal Rehabilitation, Individual Development and Education) Center for America's Wounded Veterans in October 2007. This unique program is located in the College of Nursing and Health Professions' Donald W. Reynolds Center for Health Sciences and provides combat-wounded veterans with resources for rehabilitation, counseling, financial assistance and socialization in an effort to support wounded veterans in achieving their educational goals.



Imagine your Second Life with the Center for Digital Initiatives (CDI) at ASU. This newly-designated Center for Excellence offers virtual research and educational opportunities through Second Life and Open Sim. Visitors can explore modeled replicas of Arkansas sites like the Hemingway-Pfeiffer Museum and the Southern Tenant Farmers Museum, as well as purely virtual environments such as the "Lost" Town of Napoleon, AR. The CDI resonates so strongly with online visitors that Linden Labs, the parent company of Second Life, designated the Blueberry Gallery on the ASU Virtual Campus a Top Ten Destination in June 2010.



Understand the impact of the Delta Center for Economic Development. A key component of ASU's College of Business, the Delta Center is housed in a recently-completed, state of the art 22,000 sq. ft. facility and offers a wide range of services related to the ongoing development of economic opportunities in the Delta region. The Delta Center houses a number of economic development partner organizations that, combined with numerous educational and business opportunities offered on a routine basis, foster the growth of communities, industry and entrepreneurial vitality throughout the region.



Read all about how a new collaborative effort between ASU's NSF CI-TRAIN Grant in the Department of Computer Science, College of Engineering, College of Sciences & Mathematics and Information and Technology Services has resulted in a new High Performance Computing platform in Jonesboro that will meet our campus's growing need for computing capacity. Consisting of 3,628 cores and over 18 terabytes of storage, this shared resource will allow researchers to work in a broad spectrum of areas, from bioinformatics to soil analysis to the study of exceptionally detailed models of real world problems vital to our community.

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