A Message from the President

For more than a century, Prairie View A&M University has been a learning environment that has fostered impressive innovation. The tradition of excellence that is the cornerstone of this University has created brilliant ideas that have served our world greatly. The research conducted at this University is no exception. Each day, faculty researchers commit themselves—with tenacity and dedication—to investigate and conduct cutting edge research. Our students work alongside these world-renowned researchers on a quest to impact the world through their findings. Their commitment to the discovery of new ideas and theories are the embodiment of our University’s mission of teaching, research and service.

Because of the work done on our campus, PVAMU has gained notoriety in the areas of fusion plasma experiments. The epidemic of childhood obesity will be impacted and contaminated soils will be remediated using plant-based materials, all conceived by research conducted in our midst.

This publication will display the dedication of our researchers and students while offering insight into the work conducted in the halls of this great University each day. It is my hope that the research endeavors documented will serve to inspire future generations to exemplify excellence in their own lives.

George C. Wright, Ph.D.
President
Prairie View A&M University
A Message from the Vice President of Research and Development

Impact is defined as the force exerted by a new idea, concept, technology or ideology. The force of new ideas and concepts is one that abounds at PVAMU. Everyday researchers answer questions, solve problems and gain insight into some of the most pressing issues of our times. Their work has led to patents, publications and recognition of their peers from around the world.

As the Vice President of Research and Development, it is my pleasure to present Impact, a research publication of Prairie View A&M University. This publication is designed to serve as a snapshot of the research endeavors conducted within this University. The publication includes our student researchers and is a testament to our mission of teaching, research and service.

PVAMU’s academic research garners national and international recognition. Research conducted on this campus has demonstrated its importance in some of the most pressing and relevant issues of our time. Our research has offered insight into areas of engineering, agriculture, mathematics, biology and related sciences. While creating a presence on the global stage, we are pleased that the University has produced several scholars who have gone on to create their own impact throughout the world.

The caliber of work from PVAMU is impressive and our researchers continue to produce new discoveries and innovations. The research center profiles on the pages of this publication are certainly worthy of acknowledgement, however we know there is much work to be done. This University is up to the challenge of creating new breakthroughs and new human capital to continue our impact.

Willie F. Trotty, Ph.D.
Vice President for Research and Development
Prairie View A&M University

Army Research Office Center for Excellence in Battlefield Communications

In a combat situation, the best technology and infrastructure is essential to success. The Center for Excellence in Battlefield Communications (CEBCOM) contributes to the combat effort by working to create a novel battlefield communications network architecture that supports multi-service applications utilizing a seamless internet protocol.

The CEBCOM was established in 2004 through funding from the United States Army Research Office. With a goal of achieving national excellence in telecommunication, research and technology, the Center collaborates with the United States Department of Defense as well as state and industry entities. Students working within CEBCOM supplement their education with hands-on experience in areas vital to battlefield communications, such as wireless networks and power control for mobile ad hoc networks.

Students get to explore battlefield communications through practical experience in the Center for Excellence in Battlefield Communications. Under the direction of Dr. Dhadesugoor R. Vaman, pictured, CEBCOM research is updated regularly to address issues encountered by the United States military.
The Mixed Signal Communication Systems Lab is specifically designed to accommodate research by engineers well versed in analog and mixed signals, an area of communications research in high demand. Sponsored by Texas Instruments, the laboratory features testing, measurement and research equipment, including a complete mixed signal testing and research station mimicking TI’s own data converter laboratory.

The Digital Signal Processing Solutions Lab is sponsored by Texas Instruments and explores the application of mathematical operations to digitally represented signals. The research conducted in the DSP is vital to the market for DSP solutions products such as cellular phones, home theaters and PC multimedia.

The Broadband Technology Lab, sponsored by Sprint Communications, provides functional testing, interoperability and reliability testing of communication systems to industry partners. With its state-of-the-art telecommunications equipment and testing tools, the BTL is currently implementing a core network for secure end-to-end communications.

The Communications Control Systems Lab conducts research designed to streamline and improve communications through networked control systems utilized with respect to Homeland Security. The CCSL, developed with a United States Army Research Office grant, utilizes state-of-the-art equipment such as 2DOF and 3DOF Helicopters to address performance deterioration in networked control system technology.
Texas Gulf Coast Environmental Data Center

The Gulf Coast is an environment that offers a wealth of knowledge for ecological studies. The Texas Gulf Coast Environmental Data Center located in the Roy G. Perry College of Engineering has focused on this area since 1995. TEXGED has developed capabilities in conducting research in areas such as bioremediation using biological agents including earthworms and soil microorganisms. The Center also monitors biodiversity of habitats, ecological conservation and changes over time.

TEXGED is also utilizing remote sensing data in detecting environmental problems in the Gulf of Mexico, specifically the study of sea surface temperature of the Gulf to detect its impact on biological activities. In the past, the Center collaborated with Ain-Shams University in Egypt to establish a graduate program in Environmental Science and exchange visitors to share experience in issues related to environmental problems. The center recently established the International Journal of Environmental Science and Engineering to highlight environmental issues of concern from a scientific perspective.

Thermal Science Research Center

The Thermal Science Research Center (TSRC) is tasked with conducting basic and applied research that addresses complex physical problems related to futuristic physics and engineering endeavors. Tackling such issues as heat transfer, flow boiling and local heat transfer, the lab has developed simulations, correlations and assessments that improve the understanding of physical engineering boundaries and thresholds.

Work conducted in the TSRC centers around experimentation, engineering modeling and design, and engineering simulation. The Center also boasts additional capabilities in natural convection in enclosures and mixed convection involving internal and external geometries. The TSRC has established linkages with scholars and laboratories in Japan and Europe.

The TSRC has played an integral role in the academic development of its student researchers. Student researchers have created engineering models that are currently in use in the center. Dr. Ronald Boyd serves as the center’s director.
Cooperative Agricultural Research Center

Agriculture is present in everything, from the food we eat to the clothes we wear. The Cooperative Agricultural Research Center conducts research in the areas of Animal Systems, Food Systems and Plant and Environmental Systems to maximize the benefits of ever-present agriculture.

Funded through the United States Department of Agriculture (USDA), the Center started as an agricultural experiment station in 1947. It has evolved into an important research center that trains a large number of student researchers. Currently, two CARC scientists have been granted patents for their research work.

Started as an agricultural experiment station in 1947, CARC responds to the needs of agricultural producers, extension agents, government agencies, scientists, students, faculty, and the private sector to ensure that the best research information and technology are being developed. The Gov. Bill and Vera Daniel Farm and Ranch, pictured below, is a fully functioning facility aiding in CARC research and academics. It is an integral part of the center’s operations. CARC is under the direction of Dr. Richard Griffin.

FOOD SYSTEMS

The food systems component of CARC conducts research that addresses issues such as enhancing nutrition and improving food safety and quality. Researchers are tasked with increasing the body of knowledge related to nutrients and mechanisms implicated in illness and diseases as well as the quality and safety of value-added products.

ANIMAL SYSTEMS

The animal systems element focuses on improving the physiological mechanisms affecting reproduction, growth and performance of grazing animals such as cattle and goats. The International Goat Research Center located within CARC is essential in studying various breeds of goats.

PLANT SYSTEMS

The plant and environmental systems component conducts research within the scope of soil monitoring, biogeochemical processes and alternative cropping systems. Projects and research conducted within this system enhances the regional environment including the Texas Gulf Coast Prairie Wetland Ecosystem.
Prairie View Solar Observatory

In the years since man first ventured into space, much has been learned about the vast frontier. But as much knowledge as the world has gained, there are countless secrets waiting to be unlocked. The Prairie View Solar Observatory seeks to explore those secrets and expand the world's knowledge, specifically in the realm of solar physics, fusion plasma physics and space science.

The ground-based observatory was the first of its kind in the state of Texas when it was built in 1998. With support from the NASA/Marshall Space Flight Center and Nuclear Regulatory Commission, the dome was constructed in 1998. The primary instrument of the observatory is a 35-cm Gregorian vacuum telescope, equipped with a Daystar H-alpha filter (0.5 Å FWHM) and a SBIG ST-7 CCD camera, giving it the ability to produce images in high resolution. The Observatory also hosts the Research Experiences for Undergraduates Program sponsored by the National Science Foundation.

The observatory carries the distinction of being the first ground-based solar research facility in the state, seeing first light in December 1998 and conducting first observations in April 1999. Dr. Tian-Sen Huang is director of the facility.
NASA Center for Radiation Engineering and Science for Space Exploration

The NASA Center for Radiation Engineering and Science for Space Exploration works to develop methods of keeping astronauts and their flight instruments safe from harmful radiation for up to three years in deep space. Potentially deadly radiation is one of the limiting factors in human space exploration.

Research leaders utilize scientifically accurate “recipes” of earthly materials to recreate soil found on Mars and lunar soil to build above ground and underground “habitats.” These structures will be bombarded with radiation particles that mimic surface and subterranean exposures found on Mars and the moon. NASA uses the data as a stepping stone for further experiments to minimize the danger of radiation.

CRESSE is composed of scientists who have studied radiation research, instrumentation, environmental modeling, materials research and electronic components. Experimental and theoretical radiation studies utilize leading edge particle accelerators at Brookhaven National Laboratory, Loma Linda University Medical Center and Los Alamos National Laboratory.

Dr. Richard Wilkins is the director of CRESSE.
International Goat Research Center

Since 1983, the International Goat Research Center has solidified its presence as one of the largest and longest-established goat research programs in the country. IGRC specializes in research impacting genetics, reproductive physiology, nutrition and veterinary health. Research projects conducted at the Center also focus on products from goat milk to goat meat.

Like its name, the center’s impact is seen internationally. Scientists within IGRC have conducted goat-related research that is currently in use in Africa. The College of Agriculture and Human Sciences’ Institute for International Agribusiness Studies has been involved in a project funded by the United States Agency for International Development to improve animal health, farm management and the marketing of sheep and goats in Ethiopia.

IGRC was established in 1983 as the arm of the Cooperative Agricultural Research Center tasked with goat research. The center is considered a world leader in goat research and related outreach activities, such as the annual Goat Field Day. Above, Dr. Lou Nuti conducts a seminar for goat producers during the yearly event. Dr. Gary Newton serves as IGRC research leader.

Surface Science Facility

The environment that surrounds us is one of our most precious resources that must be tended to with deliberate care. Despite this, damage from various sources has taken its toll, ultimately increasing the need for waste abatement. The Surface Science Facility based in the Prairie View A&M University Department of Chemistry focuses on surface phenomena related to areas of environmental waste treatment, waste management and restoration.

The facility has conducted research in oxidation mechanisms on copper, ceramics for fusion energy application and soils, sediment and minerals characterization. A major goal for the Surface Science Facility is to strengthen collaborations within and outside of PVAMU to provide infrastructure access for faculty and students.

Dr. Hylton G. McWhinney leads the Surface Science Facility, which has conducted various research projects, including carbon nanotube research and surface phenomena related to environmental waste treatment, waste management and waste restoration.
Reseacher Profiles
PRAIRIE VIEW A&M UNIVERSITY boasts a wide variety of researchers representing all facets of academia, from Agriculture to Environmental Engineering. Their contributions are noted throughout the world and many are considered leaders in their respective fields. This is a small sampling of researchers from across the University.

Mr. Shumon Alam is a research associate with expertise in signal processing and telecommunication system design and architecture.

Dr. Gary Erickson is a research scientist specializing in theoretical and data-analysis projects and the development of the Integrated Space Weather Prediction Model.

Dr. Wasseem Ali is an associate professor of electrical engineering and an expert in control and power systems.

Dr. Hua-Jun Fan is a chemistry professor specializing in computational modeling on inorganic, organic and macromolecules.

Dr. Ananda Amarasekara is an associate professor of chemistry with research interests in biomass-based chemical feedstock, catalysis and ionic liquids.

Dr. John Fuller is a professor of electrical and computer engineering and an expert in high voltage transmission.

Dr. Charles Grear is an assistant professor of history with a specialization in Texas and Civil War history.

Dr. Michael Gyamerah is an associate professor of chemical engineering with a research focus on bio-ethanol fermentation for use as a fuel, fungal fermentations and biocatalysis.

Dr. Jian-ao Lian is a professor of mathematics with research interests in wavelets and applications, computer-aided geometric design, and signal and image processing.

Dr. Adela Mora-Gutierrez is a research scientist specializing in the physicochemical characterization of relevant agricultural and biological proteins by Nuclear Magnetic Resonance (NMR) spectroscopy.

Dr. Raghava Kommalapati is an associate professor specializing in remediation of contaminated soils.

Dr. Yi Lu is an assistant professor in computer science specializing in data mining, bioinformatics and service computing.

Dr. Xiaokang Yang is a research scientist specializing in fusion plasma experiment and theory.

Dr. Lijun Qian is an associate professor specializing in wireless communications and mobile networks, network security and intrusion detection, and systems biology.

Dr. Sharon McWhinney is a professor of human nutrition and dietetics. She specializes in health disparities.

Dr. Velva McWhinney is a research scientist specializing in the biochemistry of nutrition-lipid related disease problems.

Dr. Michael Nojeim specializes in nonviolence and civil resistance, Gandhi and King, peace studies, the Civil Rights movement, U.S. foreign policy and the Middle East.

Dr. Pamela Obiomen is an associate professor in the electrical and computer engineering department specializing in microelectronics and microsystems.

Dr. Olusegun Odejide is a postdoctoral researcher specializing in signal/image/video processing and communication systems.

Dr. Remi Oki is a professor of chemistry specializing in processing and fabrications of polymer matrix composites and nanocomposite materials, industrial processes and military applications.

Dr. Irvin Osborne-Lee is a professor and head of chemical engineering. His research interests include modeling and analysis, as well as laboratory studies.

Dr. Godson Osuji is a research scientist of plasma physics and controlled nuclear fusion. He specializes in design and testing of high power microwave and RF sources, RF heating and current drive experiments.

Dr. Yongpeng Zhang is an assistant professor of engineering technology with research interests include computer graphics, scientific visualization 3D modeling and virtual reality.

Dr. E. Gloria Regisford researches the role of reproductive hormones in ovarian carcinogenesis and the process of embryo implantation.

Dr. Eric Risch is an agricultural engineer researching goat milk and meat production and assisted in establishing an environmental-based GIS laboratory.

Dr. Eugene Romashets is a research associate focusing on the use of satellite data to observe solar active regions and small solar magnetic fields on the sun’s surface.

Dr. Matthew Sadiku is a professor in the electrical and computer engineering department and an expert on electromagnetism.

Dr. C. L. Tolliver is a professor in the electrical and computer engineering department. His research interests include communication systems, RF and security systems.

Dr. Yonghui Wang is an assistant professor of electrical technology with research interest in image and video processing based on wavelet applications.

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Prairie View A&M University
was founded in 1876 and is the second-oldest public institution of higher education in Texas. With an established reputation for producing engineers, corporate leaders, nurses and educators, the historically black college offers a variety of bachelor’s, master’s and doctoral degree programs through eight colleges and schools. A member of The Texas A&M University System, the University is dedicated to fulfilling its land-grant mission of achieving excellence in teaching, research and service.

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