HOW TO DO BUSINESS WITH PRAIRIE VIEW A&M UNIVERSITY

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PRAIRIE VIEW A&M UNIVERSITY
The information contained on this compact disk provides an overview of the research efforts at Prairie View A&M University. For more information, details and further interest in collaboration with the University, please contact the address on the last slide in this presentation. No duplication of the material contained herein is permitted without the prior permission of Prairie View A&M University.
Dear Friends, Supporters and Potential Partners:

It is indeed a pleasure to present this information as a summary of expertise and capabilities present at Prairie View A&M University. The University has invested heavily in educational, research and service infrastructure in a variety of scientific, technical and related fields. This investment yielded outstanding results, in terms of original research, community activities, and well-prepared graduates in all disciplines who have contributed tremendously to the workforce of the State of Texas and the nation. These accomplishments are an important part of and the underpinnings of a broader effort to maintain and enhance the economic stability of Waller County, the State of Texas and the nation.

The areas of research discussed in this booklet form the nucleus of present research efforts and will strongly influence the theme of our future endeavors. Each area has interdisciplinary faculty and student support in addition to specialized laboratories.

Now, at the dawn of the Third Millennium, the University is enhancing the fourth component of its mission - relevance. In addition to pursuing the already successful research directions, we are ready and anxious to pursue commercialization and technology transfer scenarios. We are poised with several proof-of-concept results that should provide the basis for just such scenarios.

We feel that it is imperative for Prairie View A&M University to make critical partnerships with other academic, community, industry and government organizations. These partnerships can significantly strengthen focus areas and enhance our capability for the future. We invite you to work with us so that both our organizations may prosper.

Sincerely,
A. Anil Kumar

Charles A. Hines, Ph.D.
President

Willie F. Trotty, Ph.D.
Vice President for Research & Development

A. Anil Kumar, Ph.D.
Director of Research & Special Assistant to the President for Science & Technology

Marcia Shelton, M.S.Ch.E
Compliance Officer
RESEARCH ENHANCEMENT
STRATEGIC PLAN AT-A-GLANCE - 2000-2004

2000
- Begin quarterly workshops for capability building.
- Initiate new programs in bioengineering/biotechnology/biomedicine, cultural studies, workforce development
- Prepare and submit proposals for the IPHC.
- Set in place a firm contracts infrastructure.

2001
- Initiate new research programs in transportation, technology base for crime prevention.
- Enhance the annual research expenditures to at least $12M.
- Create a Center for Bio-Engineering.
- Establish a center for teacher education and training in environmental disciplines.

2002
- Initiate and sponsor an annual research symposium.
- Establish large-scale training programs.
- Build towards large-scale multi-institution centers for integrated research-education projects.
- Enhance contract response capability.

2003
- Enhance the annual research expenditures to at least $16M.
- Enhance contracts funding.
- Build adequate local funds to initiate/support novel areas.
- Establish a stellar University Research Advisory Board.
- Explore and support technology transfer initiatives on Campus.

2004
- Explore creation of university-initiated technology incubators.
- Enhance the annual research expenditures to at least $20M.
- Set in place an external liaison structure for performing frequent contractual projects.
- Explore establishment of small businesses initiated by PVAMU.
<table>
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<tr>
<th>College/University</th>
<th>Rank</th>
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<tr>
<td>Howard University ($29 million)</td>
<td>1</td>
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<tr>
<td>Morehouse School of Medicine</td>
<td>2</td>
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<tr>
<td>Florida A&amp;M University</td>
<td>3</td>
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<tr>
<td>NC Ag &amp; Technical State University</td>
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<tr>
<td>Hampton University</td>
<td>5</td>
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<tr>
<td>Clark Atlanta University</td>
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<tr>
<td><strong>Prairie View A&amp;M University ($13.8 million)</strong></td>
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<tr>
<td>Tennessee State University</td>
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<tr>
<td>Alabama A&amp;M University</td>
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Source: NSF Issue Brief, 08/26/99
## Top 10 HBCUs Ranked by Federally Financed R&D Expenditures in FY 1997

<table>
<thead>
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<th>College/University</th>
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<tr>
<td>Tuskegee University ($29 million)</td>
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<td>Clark Atlanta University</td>
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<td>Howard University</td>
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<tr>
<td>Morehouse School of Medicine</td>
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<tr>
<td>Meharry Medical College</td>
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<td><strong>Prairie View A&amp;M University</strong></td>
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Source: NSF Issue Brief, 08/26/99
## Total Expenditures for Sponsored Programs
### Texas A&M University System - FY 1998

<table>
<thead>
<tr>
<th>College/University</th>
<th>Rank</th>
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<tr>
<td>Texas A&amp;M University and Services</td>
<td>1</td>
</tr>
<tr>
<td>Prairie View A&amp;M University</td>
<td>2</td>
</tr>
<tr>
<td>Texas A&amp;M University at Kingsville</td>
<td>3</td>
</tr>
<tr>
<td>Tarleton State University</td>
<td>4</td>
</tr>
<tr>
<td>Texas A&amp;M University at Galveston</td>
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<tr>
<td>West Texas A&amp;M University</td>
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<td>Texas A&amp;M University at Commerce</td>
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<td>Texas A&amp;M University at Corpus Christi</td>
<td>8</td>
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<tr>
<td>Texas A&amp;M International</td>
<td>9</td>
</tr>
<tr>
<td>Texas A&amp;M University at Texarkana</td>
<td>10</td>
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</tbody>
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Source: THECB
ONGOING RESEARCH AT PRAIRIE VIEW A&M UNIVERSITY

MAJOR RESEARCH GROUPS - 1

NOVEL INTELLIGENT SYSTEMS EXPLORERS (NISE)
A. Anil Kumar, Director

CENTER FOR APPLIED RADIATION RESEARCH (CARR) &
Richard T. Wilkins, Director

CENTER FOR MATERIALS, MICRODESIGN & MICROFABRICATION (CM³)
Thomas N. Fogarty, Director

NETWORK RESOURCES TRAINING SITE (NRTS)
John R. Williams, Director

MINORITY INSTITUTIONS TECHNOLOGY SUPPORT SERVICES (MITSS)
Willie F. Trotty & A. Anil Kumar

TEXAS GULFCOAST ENVIRONMENTAL DATA CENTER (TEXGED)
Safwat Shakir, Director
ONGOING RESEARCH AT
PRAIRIE VIEW A&M UNIVERSITY
MAJOR RESEARCH GROUPS - 2

FUTURE AEROSPACE SCIENCE & TECHNOLOGY (FAST) CENTER
Paul O. Biney, Director

THERMAL SCIENCE RESEARCH CENTER (TSRC)
Ronald D. Boyd, Director

COOPERATIVE AGRICULTURAL RESEARCH CENTER (CARC)
Alfred Parks, Director

CENTER FOR AREA INTERNATIONAL STUDIES (CAIS)
Fredoline Anunobi, Director

TEXAS JUVENILE CRIME PREVENTION CENTER (JCPC)
H. Elaine Rodney, Director
“Partnering with industry, government and academia on developing enabling technologies for future communication systems.”
NISE GROUP PROJECTS

- Vector Quantization Modulation (VQM)
- Communication Systems Simulator (CSIM) - A Novel Program for Simulating and Evaluating Modern Communication Systems
- Image Compression Techniques For Digital Image Libraries
- Estimation Of The Channel Transfer Function Using Higher Order Statistics (HOS)
- Bone Conduction Headset Development
- Electromagnetic Compatibility Simulation Laboratory (ECSL)
- Databases for the Internet
Future information systems, both in military and commercial applications, will be supported by heterogeneous networks that use a variety of high and low bandwidth channels. Complex integrated traffic requirements will be supported including voice, data, image and video. The objective to win decisively and promptly will require that the warfighter have access to enhanced multimedia information-transport capabilities to ensure command and control decision-cycle superiority in an economic manner. The Novel Intelligent Systems Explorers Group, addresses problems relating to future communication systems, their components and the network and component (processor and memory) hardware architecture underlying them. The research encompasses software simulation program development to system level testing and characterization. NISE Group's approach is to create the building blocks for various technological needs of the twenty-first century communication and information processing systems.
Bone Conduction Communication Systems
By G. Novelo & A. A. Kumar (Initially Supported by NASA-JSC)

A laboratory prototype unit is available for further development.

The unit was demonstrated at Inspection’98 at NASA Johnson Space Center, October 1998 with excellent reviews.

Plethora of commercialization and technology transfer applications:

• “Plug & play” interface with wireless systems (US Army)
• Empowering technology for people with disabilities
• Communication for fire fighters
• Communications for law enforcement
• Space communications

Technology Transfer demonstration for the Houston Fire Department at NASA-JSC (Fall 1999)
Modulation plays an important role in a digital communication system. Most transmission media require digital modulation to be performed for reliable transfer of information. However, with the proliferation of wireless communications, we still and will continue to rely heavily on the open atmosphere as a major medium of transmission. VQM is a highly promising technique for accomplishing the modulation task and it also performs a low level encryption. At a cost of more complexity in codebook design, extensive channel coding can be incorporated in VQM and performed in a single step along with modulation and encryption. However, VQM allows for external encryption and channel coding to be performed as well. The goal of this thesis is to introduce a new digital modulation technique and provide performance analysis results that indicate the practicality of the method.

Performance results indicate the viability of VQM technology in several applications. As the military is in constant search of a reliable communications technology for use in combat situations, the performance measurements indicate that VQM could be a promising technique that can be used for such applications. Further, the encryption capability of VQM make it an attractive alternative.
The need for a new program in this area is due to the fact that available commercial software is designed to work in a fast, efficient and optimized fashion for general systems, it may not be suited for specific needs. For some applications it is required to customize the software. Every stage of the communication system was implemented as a collection of routines and libraries inside the program. CSIM is a prototype of a comprehensive program, developed in-house at Prairie View A&M University. It is modular, flexible, user controllable and user friendly. CSIM provides excellent controlled bench marks for comparison with other simulation programs. CSIM is fully functional and ready to be generalized to include other modules. Applicable to multiple areas, not only signal processing in the military but also in the commercial/industry areas for different processes. The modular routines and libraries developed herein can be embedded in such a complex communications software. The program has an “open” structure in the sense that each module can be interfaced with other standard libraries with a minimum of change in the code.
In transmission applications, such as broadcast television, remote sensing via satellite, aircraft, radar, sonar, teleconferencing, computer communications, facsimile transmission, and multimedia systems, compression techniques are constrained by real time and on-line considerations that limit the size and complexity of the hardware. There are three main reasons why present multimedia systems require that data must be compressed: 1) large storage requirements of multimedia data, 2) relatively slow storage devices that do not allow playing multimedia data (specially video) in real-time, and 3) the present network bandwidth, which does not allow real-time video data transmission.

Wavelet-based compression schemes are relatively new techniques for image compression with excellent results yielding higher compression ratios, as well as applying multiresolution properties to image retrieval and visualization. People working with wavelets think that it should be developed to be a wavelet image compression standard more general than just for fingerprints applications (FBI). Our results based on the comparison between JPEG and Wavelets also confirm that idea. Another aspect is working with moving pictures, which make wavelet methods work for video compression as well.
Signal processing with HOS has not yet become a full-blown subject, but it does carry a substantial future in the creation of advanced communication systems - sonar, radar, speech, geophysical and image processing. There is a wide variety of operations that can be done with the help of HOS and particularly with higher order spectra.

The goal, the estimation of the channel transfer function, is accomplished by a simulation program that generates a non-Gaussian signal and passed through a channel which is corrupted with a Gaussian noise. The original signal is reconstructed from the noise corrupted data. This process has yielded satisfactory results.

If non-Gaussianity, nonminimum phase, or nonlinearities are the problems to be solved in different applications, then higher-order statistics offers a new set of tools, methodology and algorithms for handling some or all of these effects.
“Radiation safety from earth to space”
International Space Station
Human Exploration & Development of Space

High Speed Civil Transport
Aeronautics
Deep Space &
Orbital Science Probes
Space Science

Future Needs
• Long Duration Manned Missions (E.g.: Mars)
• Nanoprobes
• Extreme Environment Probes

TOTAL DOSE AND SEE TESTING
PROCESS AND RADIATION INDUCED DEFECTS
LIFE SCIENCES
CIRCUIT INNOVATIONS
EMERGING TECHNOLOGIES
EVOLUTION OF RADIATION EFFORT AT PVAMU

$113K/yr  
1984

$300K/yr  
1987

$500K/yr  
MUC- 1989

Hampton NCA&TSU TAMU-K

TAMU-CS TAMU-K TSU U Arizona UH UTHS  
$900K/yr  
LRS-1992

U Alabama U Arizona UH UTHS

PennState TAMU-CS TSU Vanderbilt  
$1.5M/yr  
CARR-1995

INSTITUTE FOR RADIATION RESEARCH 2000
Radiation Sources Used By CARR

- Protons: Low Earth Orbit
  - Texas A&M Cyclotron

- Neutrons: High Atmospheric Altitudes
  - Los Alamos National Laboratory

- Gamma Rays: Total Indicated Dose Tolerance
  - University of Houston
Portable Radiation Test Unit

- Portable capability allows testing at various radiation sources
- Testing from 3.8K to 500K
- Completely computer controlled

Compact Electronic Test System

- HP4145B Semiconductor Parameter Analyzer
- Portable computer equipped with Interactive Characterization Software (ICS) and HP4145 instrument driver

Low-Temperature Radiation Test Chamber

- Oxford Ultrastat (3.8K)

Components:
- Device Under Test
- Sample Holder
- Cold Face
- Adapter to Radiation Source
- Infrared Light Source
- Electrical Feedthrough
- Control Valve
- Liquid Helium
- VC41 Oxford Gas Flow Meter
- ITC503 Oxford Temperature Controller
Experimental Setup

- I-V characteristics used to monitor PVR vs. radiation dose.
- All measurements were performed at room temperature.

Irradiations:
- Total Indicated Dose: Co$^{60}$ gamma,
- Proton: 55 Mev,
- Neutron: 1 Mev-800 Mev,
- Heavy Ions [LET (Si)]: Ne, LET=2.5; Kr LET=19 and Kr, LET=35.
World-Wide Recognition of University Activities

Cutting-Edge Hands-On Student Research

Radiation Testing and Materials & Device Characterization Second to None

Equal Partners with Majority University & Industrial Collaborators

Into the 21st Century
Materials Characterization:

1. X-Ray Photoelectron Spectroscopy
   - Chemical Mapping (30 µm resolution)
   - Back sputtering
2. Ion Scattering Spectroscopy
4. X-Ray Diffractometer
   - Single Crystal
   - Thin Films
   - Powder
5. Scanning Tunneling Microscopy
   - Ambient
   - Cryogenic
6. Ambient Atomic Force Microscopy
   - Lateral Force Microscopy
   - Magnetic Force Microscopy
7. Deep Level Transient Spectroscopy

Radiation Testing:

1. Radiation Sources:
   - Alpha Particle Test System
   - Gamma Source (UH, TAMU Veterinary School, PVAMU 1999)
   - Protons (TAMU Cyclotron Institute)
   - Cosmic Ray Simulation (TAMU Cyclotron Institute)

2. Hewlett-Packard System 82000 Integrated Circuit Test Set (operated by CARR at the TAMU Cyclotron)

3. Variable temperature testing (3.8K to 500K)

4. Shielding evaluation
Device Characterization:
1. Hewlett-Packard 4145 Parametric Analyzer System
2. Keithley System 83 Variable Temperature Probe Station with C-V & I-V Measurements
3. Charge Pumping System

Device Fabrication & Design:
1. Fully Equipped 500ft.\(^2\) Clean Room for 5μm design rules MOS devices and circuits.
2. SEM modified for e-beam lithography for submicron test devices.
3. Workstations with design and simulation software & plotters.

Device Design and Simulation Software:
1. VLSI CAD tools: LEDIT, MAGIC, OCTOOLS, LAGER, VIEWLOGIC, Mentor Graphics
2. Simulation tools: PISCES, MINIMOS, SUPREM, PSPICE, IS_SPICE, RADSPICE
3. Space Radiation Environment Simulation:
   Severn Communication Space Radiation Software
“... transfer computer network technology and promote its use in support of collaborative interdisciplinary, scientific research among faculty and students, and other scientists.”
NRTS
OBJECTIVES

• Provide User Support Services to enhance the campuses capability to manage and use the network and its resources effectively.
• Provide activities that will accelerate the development of MU-SPIN faculty and student expertise in network technology and its application to support information exchange between NASA and the MU-SPIN community.
• Provide a mechanism for integrating HBCUs and OMUs into scientific and technical programs sponsored and/or supported by NASA.
• Establish a MU-SPIN Users Working Group as a vehicle for exchanging scientific and technical information between NASA and the MU-SPIN community.
“Support the AFOSR and businesses by providing high quality testing in High Temperature and Lightweight Structural Materials ...”
FAST CENTER
PROGRAM OBJECTIVES

• Maintain an infrastructure to conduct research and development in lightweight structural composites
• Investigate the mechanisms of degradation of polyimide composites in hygrothermal and thermo-oxidative environments; use the results to formulate and process matrix resins with improved stability.
• Channel outstanding undergraduates into the Graduate program and matriculate advanced degree holders in materials.
• Become an independent research center after six years with sustainable contractual support from government and industry.
• Become a resource Center for businesses in the processing, characterization and testing of polymer-matrix composites.
THE FAST CENTER TEAM

AFOSR

AFRL/UDRI
-MLB
-MLS

BF GOODRICH

BOEING

CARR (NJSC)

CONSORTIUM
(ARL)

NASA GLENN

NASA LANGLEY

N. GRUMMAN
(NASA LRC)

PVAMU
FAST CENTER

PVAMU
Mech. Engr Dept.
Chemistry Dept.
Research Infrastructure

**Polymer Formulation Lab**
- TGA with FTIR Interface
- High Res TGA
- Modulated DSC;
- 2980 Multipurpose DMA
- HPLC, Nicolet FTIR

**Polymer Processing & Environmental Simulation Lab**
- Convection and Vacuum Ovens
- Heated blanket curing system
- Heated Platen Press
- Autoclave (300psi, 800 °F, CPC)

**Mechanical/Microstructural Characterization Lab**
- Instron 5582 with HT furnace
- and several test fixtures
- SEM, Optical microscope, XPS

Current Capabilities

We have the Capability to:

- Fabricate
- Process/Cure/Postcure
- Perform various environmental aging &
- Test/characterize

Composites, Neat Resins, and Composite adhesives
FAST CENTER

SIGNIFICANT ACHIEVEMENTS

- Repair of HTOMC’S
  - Adhesive Characterization
  - Out of Autoclave Processing

- Environmental Durability of HTOMC’S
  - Fatigue
  - Hygrothermal/TOS of BMI’S
  - Blistering

- Model Compounds

- TECH Transfer
  - Blister (NASA LeRC)
  - Superimide800 (BFG)
  - Model Compounds (AFRL)

- Collaboration
  - Lyntech (Polymer Electrolyte)
  - ARMY (Durability of Armored Composites)
  - Bell Helicopter (Characterization)
“The Mission of the TSRC is to Conduct Basic and Applied Research, and Design in the Board Engineering Area of Thermal Science.”
THERMAL SCIENCE 
RESEARCH CENTER (TSRC)

MISSION
The Mission of the TSRC is to Conduct Basic and Applied Research, and Design in the Broad Engineering Area of Thermal Science.

EMPHASIS
Basic Research
Industrial and Applied Research
Advanced Design
(1) Commercialization of Research and Development (R&D)
(2) Development and Design
CURRENT WORK

1. High Heat Flux Accommodation
   (a) Magnetic Fusion Reactor Components
   (b) Electronic Cooling Components

2. Space Research and Commercialization
   (a) Space Thermal Management Systems
   (b) 2-D and 3-D Two-PHASE Flow Boiling Characterization

3. Thermal Science Research Area Classification
   (a) Conjugate Heat Transfer
   (b) Local Heat Transfer and Flow Boiling in Non-Uniformly Heated Channels
   (c) Mixed Convection in Internal and External Geometries
   (d) Future Expanded Concentration
      (1) Conjugate Heat Transfer (Expanded)
      (2) Flow Visualization Via Optical Interferometry
      (3) Computational Heat Transfer and Fluid Dynamics
The Computational Fluid Dynamics (CFD) Institute, established in partnership with the Rocketdyne Division of Boeing North America and headed by Dr. Ziaul Huque, was established in 1996. It has its own well equipped shop and laboratory facilities in addition to the elaborate computer and library facilities at the college and university level. The institute currently has two ongoing research projects with NASA Marshall and Rocketdyne. The Marshall grant is a two-year project to develop CFD technology for supersonic ramjet/scramjet combustion. The work involves detailed analysis using CFD of a Rocket Based Combined Cycle propulsion system for Single-Stage-to-Orbit (SSTO) space vehicle. The Rocketdyne subcontract is to perform detailed analysis of an Air Argumented Rocket (AAR).

The Institute has one Silicon Graphics workstation, two IBM RS6000 workstations and several SUN workstations. The Unix based applications available include USA, UNIS, Mentor Graphics, SoftPc 3.1, ANSYS, Aries, FLUENT CFD software and ADAMS dynamic analysis software. The institute also has the STARCD code that is popular with the automobile industry and the KIVA code for internal combustion engine research computations. For geometrical specifications the institute uses the popular Pro-Engineer CAD program. The CAD drawings are transferred to grid generating software. The institute currently has two grid programs, Genie++ and TrueGrid. It has close collaboration with the team of the National Grid Project System (NGP) at Mississippi State University, that enables us to obtain state of the art grid generation software.

The Institute recently acquired the NPARC (Navier Stokes Equation solver) and ALLSPD(combustion code) from NASA for use in research and training of graduate students. Planned research include the use of these codes in a parallelized environment consisting of Pentium based PC workstations. This will enable Parallel High Performance CFD Computations including optimization to be performed at Low Cost.
SELECTED RESEARCH IN ENVIRONMENTAL SCIENCE AND ENGINEERING AREAS
Remediation

- Surfactants (Natural & Commercial)
- Colloidal Gas Aphron (CGA) Suspensions
- Bioremediation (Natural Attenuation)
- Phytoremediation
- Electrokinetics

Separation Processes

- Pre- Dispersed Solvent Extraction (Polyaphrons)
- Surfactants and Mineral Oxides (activated carbon)
Remediation

- Surfactants (Natural & Commercial)
- Colloidal Gas Aphron (CGA) Suspensions
- Bioremediation (Natural Attenuation)
- Phytoremediation
- Electrokinetics

Separation Processes

- Pre- Dispersed Solvent Extraction (Polyaphrons)
- Surfactants and Mineral Oxides (activated carbon)
Process Wastewater Reclamation using Polyaphrons

- Microbubbles (10-30 µm) produced using an organic solvent and surfactant solution (95% aqueous solution and 5% solvent)
- Double layer of surfactant film surrounding the solvent – Stable
- Very effective in recovering HOCs from Aqueous Solution
- Due to high surface area of the bubbles, very little solvent is required to treat wastewater
- Can be done in simple columns in either batch or continuous mode of operation
- Recoveries as high as 90-95% were recorded
- Possible to recycle the solvent
- Green Chemistry (reduces the volume of solvent required significantly)
Application of Natural Surfactants for the Remediation of Contaminated Soils and Sediments

- Plant based surfactant (fruit extract)
- Comparable to Commercial surfactants in solubilization and desorption
- Showed great potential for soil flushing in laboratory 1-D soil columns
- Could be used for cleanup of contaminated soils and sediments in either in-situ or ex-situ processes
- Non toxic and is easy to prepare (simple water extraction)
- Easily biodegradable
Application of Colloidal Gas Aphron Suspensions for In-situ Soil Remediation
(R. Kommalapati)

• Microbubbles generated from surfactant solutions
• Double layer of surfactant film surrounding air bubble
• Stable and can be pumped
• Could be used to supply nutrients, oxygen and microorganisms to the subsurface
• Showed Great Potential for in-situ soil flushing
• Removal of NAPL from surface using the suspensions and promote bioremediation of residual contaminants
• Other applications include separations of HOCs and heavy metals from aqueous solutions
Other Remediation Technologies for Contaminated Soils and Sediments
(R. Kommalapati)

Phytoremediation

- Certain HOCs (moderately hydrophobic) and inorganics (including heavy metals) are very suitable for remediation by plant uptake
- Activity mainly in the Rhizosphere
- Has shown great potential
- Low capital cost, aesthetic benefit
Other Remediation Technologies for Contaminated Soils and Sediments
(R. Kommalapati)

Electrokinetics

- Particularly suitable for heavy metals
- Electric potential is applied across electrodes inserted in a soil to generate an electric field which results in transport of species
- Electroosmosis is used to mobilize pore fluid and to flush the soil system
- Great potential
The Texas Gulf Coast Environmental Data Center (TEXGED), funded by the National Aeronautic and Space Administration (NASA) and headed by Dr. Safwat Shakir, is an academic center for knowledge and technology of Remote Sensing. This center is the result of the partnership and collaboration from NASA, Universities, and TRW Space & Technology. TEXGED is a center for collecting data from space through the TRW HyperSpectral Imaging System. The center established a database management system which provides researchers and decision makers with information they need in planning and assessing the environmental problems facing the southern region along the Gulf Coast of Mexico and the United States of America. TEXGED also provides services to local and state agencies regarding the environmental data analysis.
House Bill 1550, enacted by the 75th Texas Legislature, regular Session, 1997, authorized the establishment of the Texas Juvenile Crime Prevention Center at Prairie View A&M University (PVAMU) under the control and management of the Board of Regents of the Texas A&M University System (TAMUS).

The Center will conduct and evaluate research relating to juvenile crime; provide degree programs and continuing education; serve as an information resource; develop programs and policies to address juvenile crime; and collaborate with communities, state agencies, and private entities to implement programs and policies that target the prevention of juvenile crime and delinquency and related social problems. Prairie View A&M University, the second oldest public institution of higher education in Texas, originating in 1876, is uniquely qualified to serve as a platform for addressing the senseless youth violence, drug use, and gang-related activities that are devastating communities, families, and individuals, and consuming substantial fiscal resources of federal, state, local, and private agencies.

Prairie View A&M University provides comprehensive programs that teach, research, and provide public service to historically bypassed and under-represented constituents with diverse ethnic and socioeconomic backgrounds. The clientele traditionally served are growing at a significantly faster rate than any other population group in Texas and across America. This is especially revealing in the Texas juvenile justice system, where African-American and Hispanic males are over-represented, compared to the state’s population.

The Texas Juvenile Crime Prevention Center will enable Prairie View A&M University to undertake a comprehensive, multi-faceted effort to target the problems of youth violence, crime, drug use, and gang-related activity in a relevant, collaborative, and productive manner.
TEXAS INSTITUTE FOR THE PRESERVATION OF HISTORY AND CULTURE (IPHC) on the campus of Prairie View A&M University

IPHC is established by the Board of Regents of the Texas A&M University System by an act of the Texas State Legislature, August 1999 (House Bill 889).
SPECIFIC OBJECTIVES

• As an Archive, to obtain and preserve materials of history and culture related to African Americans in Texas, their achievements and general experience, emphasizing especially their contributions to Texas economy, and interactions with other ethnic groups.

• As a Museum, to display materials on Texas African Americans in such a manner as to enhance the general public awareness about Texas African American history and culture.

• As a Research Center, to conduct extensive research, make available materials on Texas African American history and culture to scholars and others who seek definitive materials for educational and cultural purposes, and to enhance the knowledge base.

• As an Educational and Outreach Center, to enhance the general awareness of the contributions of Texas African Americans to the state of Texas and the nation, as well as provide specialized curricular structure for advanced degree programs in African American studies.
Science and Engineering Alliance (SEA)

A Unique University-Government-National Laboratory Partnership

Robert L. Shepard, Ph.D.
Executive Director

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Four HBCUs conduct nationally & internationally recognized work in many areas

**Alabama A&M University** researchers are growing crystals that are being utilized in R&D projects throughout the world.

**Jackson State University** biologists are experimenting with a unique way of using fungi to reduce our dependence on chemical pesticides.

**Prairie View A&M University** engineering program utilizes the latest in computer hardware and software toward meeting some fundamental thermal research challenges that may bring the practical use of fusion reactors closer to reality.

**Southern University and A&M College** has a well-equipped laser laboratory for its physics and engineering research projects, and by virtue of its location, collaborates with scientists at the Center for Advanced Microstructures and Devices (CAMD).
PVAMU - Prairie View A&M University
SU-A&MC - Southern University and A&M College
LU - Langston University
UH-D - University of Houston-Downtown
AAMU - Alabama A&M University
B-CC - Bethune-Cookman College
FAMU - Florida A&M University
HU - Hampton University

HMIRA - A NEW ALLIANCE

GSU - Grambling State University
CC - Claflin College
OC - Oakwood College

Hank Valentine, CEO
HBCU-MI Research Alliance
STRATEGIC ADVANTAGES OF DOING BUSINESS WITH PRAIRIE VIEW A&M

• Outstanding leadership and administration
• Accredited Education, Engineering, Technology, Computer Science and Architecture Programs
• Efficient Research Administration Infrastructure
• Efficient Overhead Utilization Policy
• Excellent Physical Infrastructure
• Strategic Location in the Northwest Houston Corridor
• Effective partnerships with Academia, Industry & Government
• Geographical Location Relative to Other HBCUs
• Three Trans Texas Video Network Locations on Campus
• Comprehensive distance learning facilities
DISTANCE EDUCATION CAPABILITIES
AT PRAIRIE VIEW A&M

• Hub for North Star Telecommunications Network
• Electronic classroom with standards-based VTel Codec operating at 384K
• Direct connection to TTVN (Trans Texas Video Network) and dial-on-demand to Texas VidNet
• Eight port multi-point control unit for eight site conferences
• Direct connection from classroom to the Internet
• Direct connection to tunable C/Ku band satellite dish
• Direct connection to campus for free and cable television channels
• VCR, Laser Video Disc and Computer inputs
CONTRACTS AND GRANTS MANAGEMENT

PRAIRIE VIEW A&M UNIVERSITY OFFICE OF SPONSORED PROGRAMS
- Office of Research & Sponsored Projects

PRAIRIE VIEW A&M RESEARCH FOUNDATION (PVAMRF)
- A subsidiary of Texas A&M Research Foundation
- An incorporated not-for-profit organization
- Proposal and budget preparation, post award management, impeccable financial reporting, assistance in CRADAs and MOUs, assistance in legal affairs, assistance in technology transfer & commercialization

TEXAS ENGINEERING EXPERIMENT STATION (TEES)
- State operated
- Maximal indirect cost return to the College of Engineering & Architecture
- Research opportunities, post award management, assistance in technology transfer & commercialization
TYPICAL SERVICES AVAILABLE TO PARTNERS

Prairie View A&M Research Foundation

- Travel
- Procurement
- Contractual agreements review
- Customer invoices
- Sub-contractor cost management
- Problem resolution w/ vendors
- Security services, clearances, classified document storage
- Liability & equipment insurance
- Comprehensive Accounting Services
- Timely, accurate, responsible reporting
- Legal services
- Proposal preparation

Prairie View A&M University

- Administrative support
- Hiring of faculty/staff/students
- Payroll matters
- Space for the project
- Facilities for conferences/meetings
- Mail services
- Distance education facilities
- Employee briefing/debriefing
- Personnel policies administration
- Benefits program administration
- Network facilities for communications
WAYS TO INTERACT WITH PVAMU

• Technical affiliation

• Cooperative research and development agreements (CRADAs)

• Joint proposals for Small Business Innovation Research (SBIR)/Small business Technology Transfer Research (STTR) initiatives

• Joint proposals for technology transfer projects

• Business and Technology Incubators
A Strategic Framework of Research & Development for PVAMU of the Twenty-First Century

- Wealthier Communities
- State & Federal Trained Work Force
- Solution to Juvenile Crime Problems
- Faculty & Teachers of the Future
- Technology Prototypes

- Federal Labs
- Industry
- HBCU/MIS
- Academia
- Community Centers
- Small Businesses

- Technology Incubators
- Industrial Cluster
- ORD
- Technology Advisory Panels
- Research Foundation
- Co-Op Extension

- PVCC
- Texas JCPC
- CARR/CM³
- FAST
- CARC
- TSRC
- TXGED
- NRTS

- Research
- Training/Retraining Programs
- Outreach High School & Pre-College Programs
- Community Programs
- Education

- Relevance to Society
- External Organizations
- Interfaces/Liaisons
- Major Activities
- PVAMU Enterprises
A WORLD OF POTENTIAL AT PVAMU

Excellent infrastructure
For support services

Proven capability
For research/contract
management

State-of-the-art
Laboratories for
Testing and evaluation

Expert faculty/
Research staff for
consulting

Human resource
availability

Flexibility & Speed of
Response
DOING BUSINESS WITH PVAMU

Performance
Vision
Adaptivity
Multi-tasking
Universal
• Cletus Udoye, Advanced Materials, Austin
• Ming Fang Zhang, AT&T, Holmdel
• Million Woldesenbet, Lucent Technologies, Allentown
• Mayra F. Caceres, AT&T, Holmdel
• Adriana Caceres, Prairie View A&M University
• Anowarul Huq, CISCO
• Gerardo Novelo, Southwestern Bell, Houston
• Singhquaverton Madden, Toshiba, Houston
“Get ready, there’s a tsunami coming. Just below the surface an immense change is taking place. If you peer into the deep, you can see the swell beginning to form. Very soon, the terrain will become unrecognizable. But don’t look too long. This is one wave you’d better learn to ride.”

Bruce Judson and Kate Kelly in “Hyper W@rs”

“Our troubled planet can no longer afford the luxury of pursuits confined to an ivory tower. Scholarship has to prove its worth, not on its own terms, but by services to the nation and the world.”

- Oscar Handlin, Carl M. Loeb University Professor, Emeritus, Harvard University.
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