Report on Energy R&D at James Madison University

Jonathan J. Miles, Ph.D.
Professor
Department of Integrated Science and Technology
James Madison University
Harrisonburg, Virginia

Coal and Energy Commission
Virginia General Assembly
Richmond, Virginia
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Energy Education at JMU

Department of Integrated Science and Technology (http://www.isat.jmu.edu)

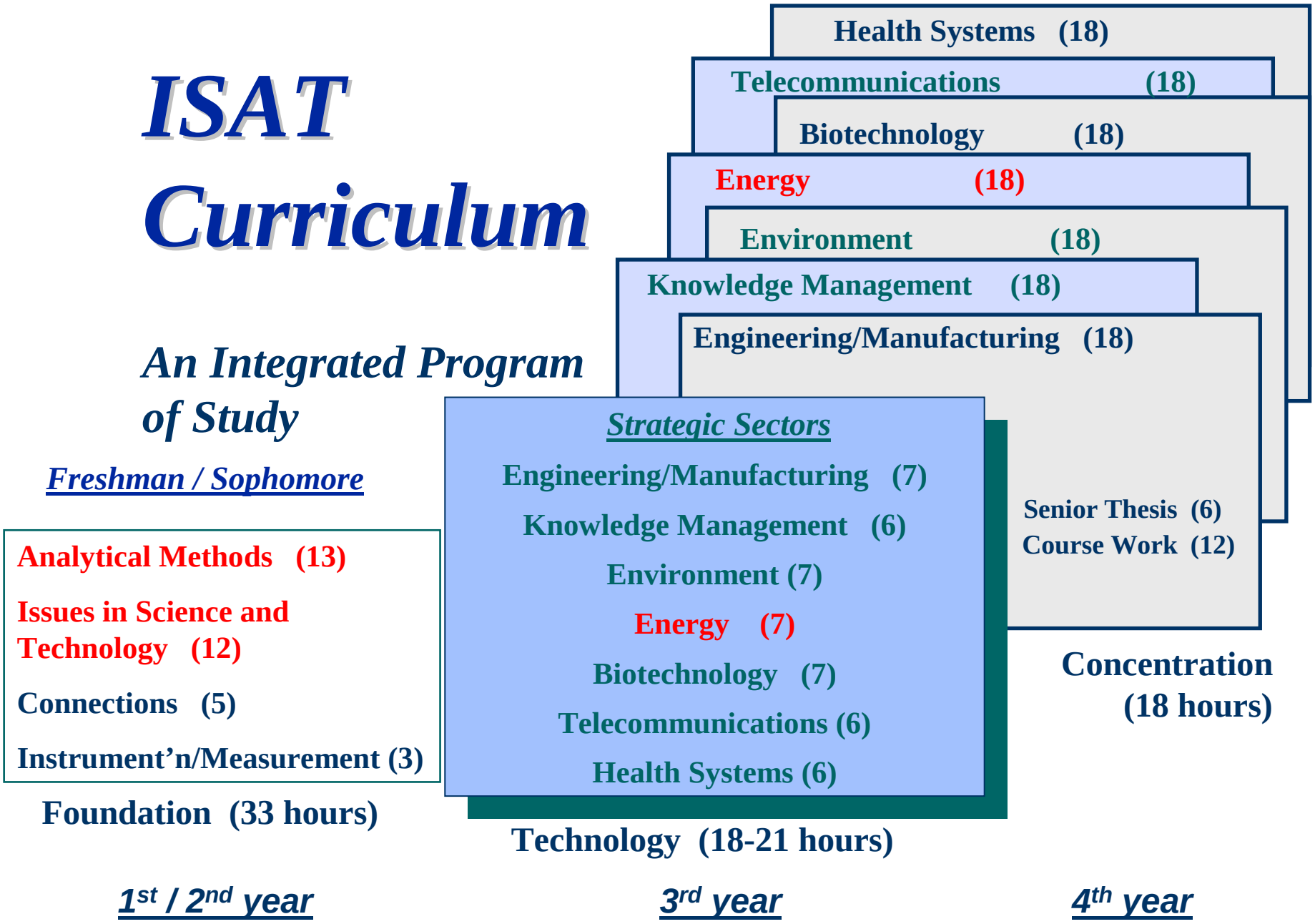
- The program is best described as a “unique enterprise among science and technology programs within higher education” that provides students a broad, liberal, science- and technology-based education to prepare them to enter technology-based industry in the 21st century.
- The vast majority of energy experts and professionals are trained in a traditional setting in which a single discipline is the prime motivator. A new paradigm has evolved at James Madison University that supports the *holistic* education and training of undergraduates with preparation for careers in all facets of energy and the related applied technologies.
- The ISAT Program has been highly successful in placing graduates into the energy field. This is highly dependent on the ability to expose our students to real-world applied and other R&D experiences.

“Real-world” Context

- Interdisciplinary Problems
- Integrated Approach
- Collaborative Teams
- Incorporate Societal Impact
- Business and Economics
- Creative Problem Solving

ISAT Curriculum

An Integrated Program of Study



Freshman / Sophomore

Teaching infrastructure that supports energy education and research

- Physical Sciences Laboratory
- Instrumentation and Measurement Laboratory
- High Bay Teaching and Research Laboratory with Steam Turbine and Solar Simulator

Municipal Resource Recovery Facility

Teaching infrastructure that supports energy education and research

- Physical Sciences Laboratory
- Instrumentation and Measurement Laboratory
- High Bay Teaching and Research Laboratory with Steam Turbine and Solar Simulator
- 10-kW Grid-Tied PV Array

CISAT 10-kW Solar Electric Plant (CSEP)

Teaching infrastructure that supports energy education and research

- Physical Sciences Laboratory
- Instrumentation and Measurement Laboratory
- High Bay Teaching and Research Laboratory with Steam Turbine and Solar Simulator
- 2-kW Stand-Alone PV/wind Hybrid Plant

CISAT 2-kW Solar Hybrid Electric Plant (CHEP)
(PV panels not shown)

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Malta Information
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Filmed In Malta

ISAT/Geog Study Abroad In Malta 2006

http://malta.cisat.jmu.edu/

'ISAT/Geography in Malta 2006' group at the Citadel in Rabat (Victoria) on Gozo, 20 May 2006

The 2006 program is led by ISAT Professors Jonathan Miles, Bob Kolvoord, CJ Brodrick, and Amy Townsend, and Mr. Justin Henriques. The Sustainable Socities course is taught by the program team and ISAT graduate students Heidi Lestyán and Sonja Long.

ISAT/Energy + JMU Engineering

- Today JMU ISAT/Energy graduates are highly sought for employment, but typically not in areas involving technical development and engineering.
- The combined ISAT and Engineering curricula will provide all the elements to train ISAT and/or Engineering students as energy professionals/experts of the highest caliber in the U.S.

ISAT/Energy graduates

- More than 150 ISAT graduates since 1997 have earned the Bachelor of Science in ISAT with Concentration in Energy.
- The ISAT/Energy graduate fills a niche in the energy industry, in the government sector, with utilities, and with consulting firms.
- The unique attribute of the ISAT/Energy graduate is the ability to comprehend and analyze all aspects of energy and related technologies and applications including technical, social, economic, regulatory, and ethical.

Assessment of Energy Related Research and Development in Virginia (from CIT Report to VRTAC and DMME)

Summary of Energy Research and Development at Virginia Universities and Colleges

	Energy Generation/Sources												Energy Use/Impact				Energy Policy	
			FC/H_2		Bio-Energy			Other Renewables										
Virginia College or University	Coal, Oil, Gas	Nuclear	Fuel Cells	Hydrogen	Biodiesel	Biomass/Ethanol	Other Bio-Energy	Geothermal	Hydroelectric	Solar/Photovoltaics	Wind	Coastal (Wind/Tidal Current/Wave)	Energy Storage	Efficiency/ Conservation	Building/Construction	Environment	Energy Policy	Economics
College of William and Mary		★								•		★				•	★	
George Mason University																	•	
Hampton University	•																	
James Madison University				•	★	•	★			•	★	★		★		•	•	•
Norfolk State University										★		•						
Old Dominion University	•					•					•	★				•		
University of Virginia	•	★	★		★	•				•			•	★	★	★	★	•
Virginia Commonwealth University			•	★	•		•			•			•	•		•		
Virginia Tech	★	•	★	★	•	★	★	•	•	•	★	★	•	★	★	★	★	•
Virginia State University						•												

Some accomplishments and paths forward

- Biodiesel has been adopted as the fuel of choice by James Madison University and the City of Harrisonburg.
- Virginia Tech/JMU/Hampton Roads/Shenandoah Resource Conservation & Development (RC&D) workshops held on
  - safe farm- scale production of biodiesel from waste vegetable oil;
  - incorporation of biofuels education into the VT Planning and JMU ISAT curricula.
- Formation of a Sustainable Campus Working Group to green the campus and the installation of a H_2 electrolyzer demonstration station at JMU.
- Installation of Solar Simulator to support DOE efforts to evaluate solar collectors and NASA efforts to characterize solar sails

Some accomplishments and paths forward

State-Based Anemometer Loan Program

Web site (http://vwec.cisat.jmu.edu)

Economic and resource modeling

Feasibility studies at NASA-Wallops, Tangier Island, Oceana

Data collection and analysis

Zoning, permitting, regulatory analysis and development

Guidebook development

Virginia's wind working group

GIS-based tools for macro-siting and consideration of environmental impacts

Workshops and training sessions

Some accomplishments and paths forward

- Five faculty members from the Department of Integrated Science and Technology at JMU established in 2006 the *Center for Energy and Environmental Sustainability*.
- The new center builds upon existing connections and synergies and guides the institution toward a more eco-friendly campus environment.
- One of the first actions of the new center was to host and co-sponsor with the Virginia Sustainable Building Network in September 2006 the *Greening Virginia Universities and Colleges* conference.

Center for Energy and Environmental Sustainability

Center for Energy and Environmental Sustainability

What is CEES?

The four cornerstones of the Center for Energy and Environmental Sustainability (CEES) include the air quality, water qua
alternative fuel, and renewable energy education and research programs within ISAT. CEES formalizes relationships that
already exist within these groups thereby accomplishing multiple goals:

- Coordinate CEES-relevant work of students and faculty
- Promote the unique energy and environmental capabilities and resources within ISAT and JMU
- Enhance external relations, job placement, graduate student opportunities, and recruiting
- Expand existing external relationships and networks

Overview of the Cornerstone Programs

Air Quality: The SHENandoah Valley AIR Quality Initiative – SHENAIR- (http://www.isat.jmu.edu/shenair) is a group of citizens, elected officials, educators and regulators whose goal is to integrate economic and comprehensive planning with ecological considerations into a set of decision support tools for public and private planning related to air quality. For more information, please contact Dr. Christie Joy Brodrick.

Water Quality : The Shenandoah Valley Pure Water Forum (http://www.purewaterforum.org/about.php) promotes clean water and addresses water quality issues through networking, education, and action in the Shenandoah River watershed. The Forum strives to build a community among citizen conservation groups, business and industry, agriculture, educational institutions, local governments, and state natural resource agencies. For more information, please contact Dr. Thomas Benzing.

Alternative Fuels: The mission of the Alternate Fuels Program (http://www.isat.jmu.edu/AFP) is to educate the public about the depleting global oil reserves and facilitate the transition to clean, renewable, alternative energy sources. Research interests include improved biofuel processing strategies, algal biodiesel utilizing exhaust gas CO 2, and production of cellulosic ethanol from agricultural and municipal solid waste. For more information on alternative fuels, please contact Dr. Christopher Bachmann.

Renewable Energy : The JMU Office of the Virginia Wind Energy Collaborative (http://vwec.cisat.jmu.edu) seeks to educate the public and inform decision-makers about wind energy development in Virginia, in support of the Commonwealth's need for reliable and affordable energy, environmental quality, and economic development. For more information on renewable energy, please contact Dr. Jonathan Miles.

JAMES MADISON UNIVERSITY.

TO: Jim Baker, City of Harrisonburg
CJ Brodrick, Center for Energy and Environmental Sustainability
Lynn Cameron, Library Services
Jennifer Coffman, Office of International Programs
Greg Czyszczon, Residence Life
Mike Davis, Facilities Management
Bob Eliason, College of Business
Stephanie Hoshower, Dining Services
Winfield Hunt, Facilities Management
Bob Kolvoord, ISAT
Dave Mars, Facilities Management
Jon Miles. Center for Energy and Environmental Sustainability
Mike Mitri, College of Business
Towana Moore, Facilities Management
Maria Papadakis, Center for Energy and Environmental Sustainability
Ryan Powanda, The Green Team
Kristen St. John, Geology
TBD, Harrisonburg Electric Commission

FROM: Douglas T. Brown, Ph.D.
Provost

RE: Invitation to Serve on the Sustainable Campus Working Group

DATE: October 12, 2006

I am pleased to invite you to participate in a new JMU effort that will shape the future of our University. The Sustainable Campus Working Group is being formed to develop a strategy for improving the sustainability of JMU and reducing its environmental impacts. This working group is tasked with (1) evaluating JMU's current policies and practices as they affect sustainability, (2) exploring opportunities and options to make JMU a "green" university, and (3) proposing a path forward to institutionalize sustainability efforts on campus. I have asked Towana Moore of Facilities Management and Maria Papadakis of the Center for Energy and Environmental Sustainability to co-chair this working group.

JMU will celebrate its Centennial in two years. Many activities and changes will lead up to this event, including an initiative to launch a general engineering program with a sustainability focus. JMU clearly recognizes the importance of sustainability and of our commitment to contributing to a sustainable world. I believe that it is difficult to educate students on sustainability without formally pursuing it as a campus.

A number of individuals and groups at JMU have made significant strides toward environmentally friendly practices, and the Sustainable Campus Working Group will organize and unify these efforts into a comprehensive and coordinated strategy. Examples of collaborative projects include the Integrated Science and Technology and Facilities Management alternative fuel vehicle laboratory, the adoption of biodiesel on campus, the solar and wind power demonstration projects, and the green roof on Taylor Hall. Many of our general university practices also focus on environmental stewardship, including carpooling initiatives, energy conservation awareness programs, and sustainability planning in several of the new buildings on campus. We have established a good foundation, and next logical step is to take a coordinated, large scale view of sustainability at JMU.

PROVOST and VICE PRESIDENT FOR ACADEMIC AFFAIRS
MSC 7607
Alumnae Hall, Room 101
Harrisonburg, VA 22807
540 568 6616 Phone
540 568 7800 Fax

Some accomplishments and paths forward

A national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy

NREL National Renewable Energy Laboratory

Innovation for Our Energy Future

Announcement of a Cooperative Research and Development Agreement (CRADA) Opportunity for a Large-Scale Blade Test Facility Partnership

Summary

The U.S. Department of Energy's (DOE's) National Renewable Energy Laboratory (NREL) is seeking government, private, or non-profit partners to design, construct, and assist in operating one or more wind turbine blade test facilities capable of testing blades up to at least 70 m (230 ft) in length. DOE/NREL encourages interested parties to respond to this Cooperative Research and Development Agreement (CRADA) announcement with a proposal by October 2, 2006.

NREL is the nation's primary laboratory for renewable energy and energy efficiency research and development. The DOE Office of Energy Efficiency and Renewable Energy provides the majority of NREL's funding. The DOE/NREL motivation for this partnership is to support the U.S. wind industry's development and the deployment of large land-based and offshore wind turbines by providing testing capabilities of sufficient size and availability at a reasonable cost to the users. Blade testing is required to meet wind turbine design standards, reduce machine cost, and reduce the technical and financial risk of deploying mass-produced

wind turbine models. NREL operates the only blade test facility in North America capable of performing full-scale testing of megawatt-scale wind turbine blades. Rapid growth in wind turbine size over the past two decades has outstripped the capabilities of this blade test facility, leaving the U.S. wind industry without a suitable means of testing blades for large land-based and offshore turbines.

The necessary contributions for a blade test facility can be summarized into six key components: land, building, test stand, test equipment, facility staff, and commitments to testing. Preliminary estimates indicate the capital costs for a 70-m facility with two test stands are approximately $5 million (assuming the building is leased rather than purchased). Although DOE funding in future years is not certain, budget allocation for this facility has been planned. The DOE Wind Program intends to contribute capital contributions up to $2 million, provide NREL staff and expertise to help develop and operate the facility, and license the NREL blade resonance fatigue testing technology. A CRADA is an agreement designed to enable collaborations between government laboratories and industry partners. It is not a grant, and no funds are transferred from the laboratory to the partner or partners*. A use agreement will be established to outline the respective rights of the parties to the facility.

The time until commissioning of the facility is highly dependent on the availability of existing buildings suitable for housing a test facility and DOE funding constraints. The majority of the DOE funding for the partnership is anticipated to become available in FY08. An approximate schedule is listed in Table 1 based on this assumption. The schedule assumes a phased approach with a "go/no go" decision point to reduce the risk of project uncertainties. Other arrangements and schedules will be considered.

Table 1: Example CRADA Tasks and Schedule

CRADA Application Deadline:	Oct. 2, 2006
CRADA Negotiation:	Oct. 2006 – Dec. 2006
CRADA Phase I:	Jan. 2007 – July 2007
• Business plan — market study — revenue analysis — facility survey • Conceptual facility design • Establish use agreement • Progress review meeting • "Go/no go" decision	
CRADA Phase II:	July 2007-July 2009
• Detailed facility design • Purchase capital equipment • Facility construction • Commissioning.	

Blade Test Facility Requirements

Due to the considerable size and forces associated with large blade testing, a blade test facility has a number of unique requirements. The critical requirements are summarized below and explained in more detail in the NREL technical report *The Necessity and Requirements of a Collaborative Effort*

* The NREL CRADA model agreement terms and conditions and NREL technical report on the necessity and requirements of a collaborative effort can be accessed at www.nrel.gov/wind/bladecrada/.

Partnership to Develop a National Large-Scale Blade Test Facility in Virginia

NOVEMBER 13, 2006

James Madison University Contact:

Jonathan J. Miles, PhD
Department of Integrated Science and Technology
MSC 4102
800 South Main Street
James Madison University
Harrisonburg, VA 22807

Telephone: 540-568-3044 (office)
Fax: 540-568-2761
Email: milesjj@jmu.edu

SUBMITTED TO:

National Renewable Energy Laboratory

SUBMITTED BY THE MID-ATLANTIC CLEAN ENERGY TECHNOLOGY CENTER COMPRISING:

- James Madison University (managing partner)
- Virginia Polytechnic Institute and State University
- SENTECH, Inc.
- Environmental Solutions, Inc.
- NASA Langley Research Center
- Virginia Department of Mines, Minerals, and Energy representing the Commonwealth of Virginia

Sponsored Energy Research

2003-06

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Office of Sponsored Programs

Activity Report

Report Covers: July 01, 2003 - June 30, 2007

Blandino, Joseph R.

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
04-060	*National Aeronautics and Space Administration* Development of Infrared, Fiber-Optic, and Photogrammetric Measurement Technology for Use in an Optical Diagnostic System	To develop a low-mass optical diagnostic system for solar sails.	*PI*	Awarded 9/8/2003	$149,951.00	$50,000.00
04-069	*National Aeronautics and Space Administration* Evaluation and Development of Measurement Technology for Balloon Structures	To develop methods for using photogammetry to measure strain in balloon structures.	*PI*	Awarded 3/31/2004	$15,019.00	$15,019.00
04-117	*National Aeronautics and Space Administration* Experimental Validation of Numerical Algorithms for Predicting Solar Sail Structural Performance	To provide experimental data on the static and dynamic behavior of tensioned membranes to validate numerical algorithms on membrane behavior.	*PI*	Awarded 2/13/2004	$34,979.00	$34,979.00
04-213	*NASA Langley Research Center* Phase 2 Development of Thermographic and Photogrammetric Measurement Technology for Use in an Optical Diagnostic System for Solar Sails	To contribute to the development of a low-mass optical diagnostic system for solar sails leading to a measurement protocol for obtaining accurate temperatures from a metallized sail membrane using thermal imaging, and a protocol for using photogrammetry for determining the sail shape and dynamic behavior.	*PI*	Awarded 7/2/2004	$99,868.00	$79,999.00

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
06-008	*National Aeronautics and Space Administration* Continued Development of Measurement Technology for Scientific Balloons	To develop methods for using photogammetry to measure strain in balloon structures to obtain full coverage shape measurements and evaluate the feasibility of strain measurements during ground testing.	*PI*	Awarded 7/19/2005	$144,103.00	$49,662.00
06-130	*National Aeronautics and Space Administration* Technical Review of Concept Design of Sunshield for James Webb Space Telescope	To assess the conceptual design of the James Webb Space Telescope sunshield.	*PI*	Awarded 11/21/2005	$8,423.29	$8,563.29
06-299	*National Institute of Aerospace* Quantifying the structural behavior of parachutes during inflation and descent	To conduct experiments to investigate photogrammetric methodologies and camera configurations that support shape determination for parachutes during descent phases.	*PI*	Awarded 6/12/2006	$25,182.00	$24,982.00
05-140	*Virginia Department of Mines, Minerals and Energy* James Madison University Solar Simulator and Hydrogen Electrolyzer Project	To enhance the capabilities of the energy curriculum by requesting support for a hydrogen-producing Electrolyzer System that will be coupled with the existing 10-kW solar-electric plant and a Solar Illumination/Simulation System that will be used to demonstrate and test solar collectors.	*Co-PI*	Awarded 11/8/2004	$120,000.00	$120,000.00
				Totals:		$383,204.29

JAMES MADISON UNIVERSITY

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Activity Report

Report Covers: July 01, 2003 - June 30, 2007

Brodrick, Christie J.

Proposal Number	Agency Name	Project Title	Role	Status	Requested Amount	Awarded Amount
04-266	University of California, Davis (ITS-Davis)	Application of Fuel Cells in Trailer Refrigeration Units	PI	Awarded	$5,896.00	$5,896.00
05-203	County of Frederick	Ozone Outreach in Winchester and Frederick County	PI	Awarded	$58,761.00	$73,936.00
05-341	National Oceanic and Atmospheric Administration	SHENAIR Institute: Applied Meteorological Research	PI	Awarded	$637,523.00	$637,500.00
06-022	National Oceanic and Atmospheric Administration	Interstate Highway Climate Decision Support Tools	PI	Pending	$139,028.00	$0.00
06-087	California PATH	Survey of a Trucker Response to a Smart Park	PI	Pending	$49,994.00	$0.00

Proposal Number	Agency Name	Project Title	Role	Status	Requested Amount	Awarded Amount
06-275	County of Frederick	Ozone Outreach in Winchester and Frederick County - Year 2	PI	Awarded	$73,719.00	$73,719.00
06-286	National Oceanic and Atmospheric Administration	SHENAIR Institute - Year 2	PI	Awarded	$1,177,500.00	$1,122,000.00
05-140	Virginia Department of Mines, Minerals and Energy	James Madison University Solar Simulator and Hydrogen Electrolyzer Project	Co-PI	Awarded	$120,000.00	$120,000.00
				Totals:		$2,033,051.00

Comments:

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Office of Sponsored Programs

Activity Report

Report Covers: July 01, 2003 - June 30, 2007

Cushman, Pauline K.

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
03-199	*National Park Service* University-National Park Energy Partnership Program (UNPEPP) JMU Alternative Fuel Vehicle Program	To promote alternative fuel refueling infrastructure and to provide feasibility studies for biodiesel production in Rockingham County.	*PI*	Awarded 11/19/2003	$20,000.00	$20,000.00
04-233	*National Park Service* University-National Park Energy Partnership Program (UNPEPP) JMU Alternative Fuel Vehicle Program	To develop a biodiesel-hybrid all-terrain vehicle for use by the Shenandoah National Park and to study applicability of a fuel cell system for auxiliary power at the park's air quality monitoring station.	*PI*	Awarded 9/28/2004	$14,814.88	$14,815.00
				Totals:		$34,815.00

Miles, Jonathan J.

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
04-046	*Community Energy, Inc.* CEI Wind Energy Development in Virginia	To assist CEI in Southeastern and Mid-Atlantic wind energy development and to manage meteorological tower installation, maintenance, and data throughout the country.	*PI*	Awarded 8/11/2003	$24,000.00	$24,000.00
04-052	*U.S. Department of Energy* Wind Powering America Program - Virginia DMME Initiative - Next Step	To support JMU activities to implement the US Department of Energy Wind Powering America program in Virginia.	*PI*	Awarded 8/20/2003	$56,278.00	$56,278.00
04-065	*Harsh Environment Applied Technologies (HEAT) Inc.* STTR/Phase 1 with Harsh Environment Applied Technologies (HEAT) Inc.	To lead the theoretical study, design, and construction of a static test rig, and to conduct a series of tests and analyses to validate the design elements of a hand-held non-destructive evaluation instrument.	*PI*	Awarded 3/1/2004	$44,922.00	$44,922.00
04-072	*Environmental Resources Trust* Small Wind in Virginia Now!	To complete and implement a plan for development of small wind systems and wind power markets throughout Virginia.	*PI*	Awarded 11/17/2003	$19,596.00	$14,644.00
04-077	*U.S. Department of Energy* Wind Powering America Program to Initiate a State-Based Anemometer Loan Program (SBALP)	To assist with planned wind mapping efforts and to support opportunities to install new wind turbines for small and large wind systems.	*PI*	Awarded 10/8/2003	$500.00	$500.00

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
04-078	*U.S. Department of Energy* Proposal to the Department of Energy's Wind Powering America Program to Initiate a State-Based Anemometer Loan Program	To fully manage and implement the Wind Powering America program as a part of a JMU program within ISAT.	*PI*	Awarded 10/8/2003	$5,000.00	$5,000.00
04-080	***Virginia Department of Mines, Minerals and Energy*** Virginia Small Wind Incentives Program	Participation in the New Step Initiative in the progression toward the harnessing of clean, renewable wind energy for residential and commerical electricity customers in VA.	*PI*	Awarded 12/16/2003	$152,939.00	$152,939.00
04-109	*U.S. Department of Energy* NASA Facility Wind Turbine Study	To determine the technical and economic feasibility of a large wind turbine or turbine array on Wallops Island, determine the environmental impact of a proposed wind turbine or turbine array with respect to avian issues, determine if wind turbine(s) will cause interference to the AEGIS Combat Systems Center on site, and to determine methods to reduce the load on the island using energy efficiency techniques and practices.	*PI*	Awarded 10/29/2003	$141,820.00	$141,820.00
04-167	***Virginia Department of Mines, Minerals and Energy*** JMU/CISAT Installation of an XL.1 Wind Turbine	To support JMU educational opportunities and activities to implement the U.S. Department of Energy Wind Powering America program in Virginia.	*PI*	Awarded 1/22/2004	$2,500.00	$2,500.00
04-168	***Virginia Department of Mines, Minerals and Energy*** State-Based Anemometer Loan Program	To assist with planned wind mapping efforts and supporting opportunities to install new wind turbines for small and large wind systems.	*PI*	Awarded 1/23/2004	$5,000.00	$5,000.00
04-247	*U.S. Department of Energy* State Wind Energy Support - Tall Towers: Monitoring High Height Winds in the U.S. East Central Region	To support JMU activities to implement the US Department of Energy Wind Powering America program in Virginia.	*PI*	Awarded 12/15/2004	$47,059.00	$47,059.00

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
05-042	***Virginia Department of Mines, Minerals and Energy*** Activities in support of Virginia Wind Energy Collaborative Including Development of a Business Plan	To develop a business plan in support of the VA wind energy collaboration.	*PI*	Awarded 8/9/2004	$25,000.00	$25,000.00
05-128	***National Aeronautics and Space Administration*** STTR/Phase 1 with Harsh Environment Applied Technologies (HEAT) Inc.	To decide on the scope of and create a design for an infrared illuminator suitable for use in a prototype scanner that can be a standalone commercial product and to produce a working prototype of the thermographic line scanner.	*PI*	Awarded 10/15/2004	$2,500.00	$2,500.00
05-140	***Virginia Department of Mines, Minerals and Energy*** James Madison University Solar Simulator and Hydrogen Electrolyzer Project	To enhance the capabilities of the energy curriculum by requesting support for a hydrogen-producing Electrolyzer System that will be coupled with the existing 10-kW solar-electric plant and a Solar Illumination/Simulation System that will be used to demonstrate and test solar collectors.	*PI*	Awarded 11/8/2004	$120,000.00	$120,000.00
05-332	***Virginia Department of Mines, Minerals and Energy*** State-Based Anemometer Loan Program	To continue implementing the Wind Powering America program.	*PI*	Awarded 6/6/2005	$17,000.00	$17,000.00
05-356	***Virginia Department of Mines, Minerals and Energy*** American Solar/JMU Energy Efficiency Project	To provide solar heating and reduce energy use and cost in the new JMU modular building.	*PI*	Awarded 8/8/2005	$41,553.00	$41,553.00
06-016	***U.S. Department of Energy*** Energy Innovations & Wind Energy Development	To support the development of model working relationships and tools between environmental groups and wind energy proponents.	*PI*	Awarded 7/18/2005	$8,253.00	$8,253.00

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
06-047	***Virginia Department of Mines, Minerals and Energy*** Virginia Wind Energy Collaborative	To coordinate the activities of the VWEC partners to promote the responsible development of wind energy in Virginia.	*PI*	Awarded 8/19/2005	$20,000.00	$20,000.00
06-112	***Virginia Department of Mines, Minerals and Energy*** Tangier Island Wind and Wind Outreach	To conduct outreach to communities potentially affected by off-shore wind development, develop relationships and affiliations, and to conduct wind resource and environmental assessments.	*PI*	Awarded 10/17/2005	$191,624.00	$191,625.00
06-209	***Virginia Department of Mines, Minerals and Energy*** Renewable Energy Display	To develop a renewable energy display to deliver a series of "traveling road show" presentations to Virginia stakeholders.	*PI*	Awarded 2/20/2006	$7,000.00	$7,000.00
06-348	***Maryland Energy Administration*** Maryland Anemometer Loan Program	To assess the wind resource potential for promising sites throughout Maryland and initiate a state-based anemometer loan program for Maryland.	*PI*	Awarded 6/28/2006	$44,010.00	$44,010.00
07-057	***Virginia Department of Mines, Minerals and Energy*** Virginia Renewables Scoring System for Siting (VRS3)	To undertake the development of a scoring system for wind and solar energy facilities.	*PI*	Awarded 9/13/2006	$78,831.25	$78,832.00
04-050	***National Aeronautics and Space Administration*** Development of Infrared, Fiber-Optic, and Photogrammetric Measurement Technology for Use in an Optical Diagnostic System	To develop a low-mass optical diagnostic system for solar sails.	*Co-PI*	Awarded 9/8/2003	$149,951.00	$50,000.00
04-069	***National Aeronautics and Space Administration*** Evaluation and Development of Measurement Technology for Balloon Structures	To develop methods for using photogammetry to measure strain in balloon structures.	*Co-PI*	Awarded 3/31/2004	$15,019.00	$15,019.00

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
04-213	*NASA Langley Research Center* Phase 2 Development of Thermographic and Photogrammetric Measurement Technology for Use in an Optical Diagnostic System for Solar Sails	To contribute to the development of a low-mass optical diagnostic system for solar sails leading to a measurement protocol for obtaining accurate temperatures from a metallized sail membrane using thermal imaging, and a protocol for using photogrammetry for determining the sail shape and dynamic behavior.	*Co-PI*	Awarded 7/2/2004	$99,868.00	$79,999.00
06-008	*National Aeronautics and Space Administration* Continued Development of Measurement Technology for Scientific Balloons	To develop methods for using photogammetry to measure strain in balloon structures to obtain full coverage shape measurements and evaluate the feasibility of strain measurements during ground testing.	*Co-PI*	Awarded 7/19/2005	$144,103.00	$49,662.00
				Totals:		$1,245,115.00

JAMES MADISON UNIVERSITY

Office of Sponsored Programs

Activity Report

Report Covers: July 01, 2003 - June 30, 2007

Papadakis, Maria C.

Proposal Number	Agency Name/Project Title	Abstract	Role	Status	Requested Amount	Awarded Amount
07-080	*Department of Conservation & Recreation* South Fork Shenandoah Rapid Watershed Assessment	To conduct a rapid watershed assessment as part of assessment planning for implementing the Tributary Strategy in the South Fork Shenandoah watershed.	*PI*	Awarded 9/15/2006	$8,800.00	$8,800.00
07-094	*National Science Foundation* Increasing STEM degrees at James Madison University using a Learning Community Strategy	To increase the number of students who graduate with majors in science, engineering, or mathematics.	*Co-PI*	Pending	$1,968,595.00	$0.00
				Totals:	$1,977,395.00	$8,800.00

Institute for Infrastructure and Information Agency (IIIA)

- A Collaboration between JMU, George Mason University, and the National Institute of Standards and Technology. JMU has awarded internally:
  - **Development of a State-of-the-Art Waste to Energy Facility**, C. Bachmann, $15,000, 2006
  - **Community Electric Power Risk Assessment**, G. Baker / J. Taylor / M. Papadakis, $12,000, 2004-05
  - **Modeling the Interdependencies Between the Electric Power and Telecommunications Infrastructures**, J. Blandino, $12,000, 2004-05

Thank You, Questions?

milesjj@jmu.edu