

**McKay, Michael J.**

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**OTFWPP 11-401**

**From:** Jose M. Castro [castro.38@osu.edu]  
**Sent:** Friday, November 19, 2010 4:08 PM  
**To:** OTFWPP2011  
**Cc:** leelj@chbmeng.ohio-state.edu; 'Mikesell, Sharell'  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** 2011 OTFWPP LOI Castro and Lee.pdf

Ohio Third Frontier Wright Project Program

Attached please find our letter of intent for the Ohio Third Frontier Wright Project Fiscal year 2011 program.

Sincerely yours

Jose

Jose M. Castro  
Professor Integrated Systems Engineering  
Director Center for Advanced Polymers and Composites Engineering



Center for Advanced Polymer and Composite Engineering  
Department of Integrated Systems Engineering

A National Science Foundation  
Industry/University Cooperative  
Research Center (I/UCRC)  
210 Baker Systems Building  
1971 Neil Avenue  
Columbus, OH 43210

November 19, 2010

Phone: (614) 688-8233  
Fax: (614) 292-7852  
Email: castro.38@osu.edu

Ohio Third Frontier Wright Project Program  
Ohio Department of Development  
Technology Division  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, Ohio 43215-6130

***Subject: Ohio Third Frontier Wright Project Fiscal Year 2011 LOI-  
Commercialization of Multifunctional Nano-Papers and Nano-tailored  
Coatings for Wear Resistant and Conducting Applications***

Dear Sirs:

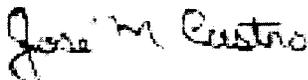
The Ohio State University (OSU) intends to submit the following Wright Project proposal: **“Commercialization of Multifunctional Nano-Papers and Nano-tailored Coatings for Wear Resistant and Conductive Applications”**. We anticipate the amount requested will be \$3 million dollars. Professor Jose Castro (PI) of Integrated Systems Engineering, Director of NSF Center for Advanced Polymer and Composite Engineering (CAPCE) and Professor L. James Lee (Co-PI) of Chemical and Biomolecular Engineering at Ohio State, Director of NSF Nanoscale Science and Engineering Center for Affordable Nanoengineering of Polymeric Biomedical Devices (CANPBD) will be the project co-directors. Professor Castro’s mailing address is ‘Department of Integrated Systems Engineering, 1971 Neil Avenue, Columbus, Ohio 43210’, phone number is (614) 688-8233, Fax number is (614) 292-7852, and e-mail address is ‘castro.38@osu.edu’. Professor Lee’s mailing address is ‘Department of Chemical and Biomolecular Engineering, The Ohio State University, 140 W.19<sup>th</sup> Ave., Columbus, Ohio 43210’, phone number is (614) 292-2408, Fax number is (614) 292-8685, and e-mail address is ‘lee.31@osu.edu’. We have secured as a collaborative partner a major Ohio company, OMNOVA Solutions and are in discussions with other large companies’ members of CAPCE and one small Ohio firm, Nanomaterials Innovation Ltd. (NIL).

We will commercialize Nano-Papers made by a layer-by-layer spray technology capable of integrating multiple commercially available nanoparticles, including carbon nanotubes (CNT), carbon nanofibers (CNF), nanoclays, and nanographites into stable and strong nanopapers (i.e., Buckeye NanoPaper™) by electrostatic bonding, offering superior structural, wear resistance and electrical conductivity properties at much lower cost and higher production rate than existing methods. Our innovative process is different from previous methods for fabricating nanoparticle-based thin films and papers, including CVD synthesized or filtration prepared CNT ‘buckypaper’ and clay or carbon nanofiber-based pre-pregs. Those prior methods have either very

high production costs or poor thickness control and homogeneity. Some require binders to fuse nanoparticles together, leading to films/papers with poor mechanical properties. Our initial results indicate good wear resistance and surface electric conductivity can be obtained with CNF and CNT nanopaper as surface coating of composites. We will commercialize this technology with focus on structural composites working with OMNOVA Solutions, NIL and other CAPCE members.

In-mold coating is an environmentally attractive alternative to painting. An Ohio Company, OMNOVA solutions is the leading supplier of in-mold coating materials. One attractive way of increasing the application of IMC's is by adding nano particles such as clays or carbon nano fibers to improve surface toughness and conductivity. They could then be use as top coat for applications where abrasion resistance and or EMI shielding is critical.

Sincerely,



Jose M. Castro  
Director  
CAPCE



L. James Lee  
Director  
CANPBD

**McKay, Michael J.**

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**OTFWPP 11-402**

**From:** leelj@chbmeng.ohio-state.edu on behalf of L. James Lee [leelj@chbmeng.ohio-state.edu]  
**Sent:** Friday, November 19, 2010 6:35 PM  
**To:** OTFWPP2011; L. James Lee; Robert Lee  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** 2011 OTFWPP LOIC Lee&Lee.pdf



November 19, 2010

The Ohio Department of Development  
Technology Division  
77 South High Street, 25th Floor  
Columbus, Ohio 43215

Phone: (614) 292-2408  
Fax: (614) 292-3769  
Email: leelj@chbineng.ohio-state.edu

**Subject: Ohio Third Front Wright Project Fiscal Year 2011**  
**LOI- Commercialization of Low-Cost Biochips and Drug Delivery Systems for Biomedical Applications**

Project title *Commercialization of Low-Cost Biochips and Drug Delivery Systems for Biomedical Applications*

Lead Applicant's Name: Ohio State University  
L. James Lee, Director, Center for Affordable Nanoengineering of Polymeric Biomedical Devices (CANPBD) (614) 292-2408,  
[lee.31@osu.edu](mailto:lee.31@osu.edu)

Contacts: Robert J. Lee, Professor, College of Pharmacy (614) 292-4172,  
[lcc.1339@osu.edu](mailto:lcc.1339@osu.edu)

Address: The Ohio State University  
1960 Kenny Road  
Columbus, OH 43210

Known Collaborators: CANPBD Member Companies and Research Institutions

Anticipated Grant Request: \$3 million

**Brief Project Description**

This proposal brings together CANPBD research and Ohio medical and industrial collaborators around enabling nanotechnologies related to polymer- and lipid-based materials in advanced biochip and drug delivery systems. Utilizing the developed low-cost nanofabrication and cell manipulation techniques, CANPBD will facilitate an integrated network of capabilities associated with academic scientists, medical researchers and MDs, and industrial engineers for supporting a portfolio of biomedical applications to promote Ohio's newly but fast growing biotechnology companies.

Sincerely,

L. James Lee

Robert J. Lee

**McKay, Michael J.**

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**From:** Montemagno, Carlo (montemcd) [montemcd@ucmail.uc.edu]  
**Sent:** Tuesday, November 23, 2010 10:04 AM  
**To:** OTFWPP2011  
**Cc:** Keener, Timothy (keenertc); Richard Harrison  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** Heliotronic Third Frontier-WPP Summary\_final.docx; Heliotronic Third Frontier-WPP LOI.docx

Sirs,

Attached is our letter of intent to apply for a FY 2011 Wright Program Project grant. If you need any additional information please feel free to contact me.

Sincerely,

Carlo Montemagno, Ph.D.

Dean  
College of Engineering and Applied Science Geier Professor of Engineering Education

University of Cincinnati  
College of Engineering  
801 Engineering Research Center  
PO Box 210018  
Cincinnati, OH 45221-0018

Tel: (513) 556-2933  
Fax: (513) 556-3626



College of Engineering & Applied Science  
Office of the Dean  
University of Cincinnati  
PO Box 210018  
Cincinnati, OH 45221-0018

Phone 513-556-2933  
Web [www.ceas.uc.edu](http://www.ceas.uc.edu)

November 23, 2010

Ohio Department of Development, Technology and Innovation Division  
Attention: Ohio Third Frontier Advanced Energy Program  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, OH 43215

RE: Letter of Intent for OTFWPP 2011

Dear Sir,

*The University of Cincinnati* is pleased to submit this Letter of Intent to submit a proposal in response to the Ohio Third Frontier Wright Projects Program Fiscal Year 2011 Requests for Proposals, OTFWPP 2011.

**Lead Applicant:** College of Engineering and Applied Science  
University of Cincinnati  
801 Engineering Research Center  
P.O. Box 210018  
Cincinnati, OH 45221-0018

**Administrative Contact:** Dr. Carlo Montemagno  
[carlo.montemagno@uc.edu](mailto:carlo.montemagno@uc.edu) (513) 702-2911

**Technical Contact:** Dr. Carlo Montemagno  
[carlo.montemagno@uc.edu](mailto:carlo.montemagno@uc.edu) (513) 702-2911

**Project Title:** Nanoengineering the Production of Abiotic/Biotic Environmentally Sustainable and Economically Competitive Biofuels

**Estimated Grant Funds to be Requested:** Wright Capital Funds \$1,000,000

**Collaborators:** Heliotronic Energy System, LLC  
490 E. Sharon Rd  
Glendale, OH 45246  
Attn: Richard Harrison  
[RHarrison@fivestates.com](mailto:RHarrison@fivestates.com) (310) 795-7180

**Description:** We have engineered and are commercializing a carbon fixation/energy production platform using a novel nanoengineered system that is composed of a unique molecular assembly of stable proteins that mimic the natural photosynthetic process with unparalleled efficiency. This energy production system as currently demonstrated is almost twice as efficient as the best plant or biomass production method to date. Furthermore, the process is inexpensive; at the current state of development the liquid fuel is produced at a cost of \$2.44 per gallon of gasoline equivalent. With further development this technology has the potential of producing fuel at a cost of less than 75 cents per gallon of gasoline equivalent. The capital plant costs have an estimated payback of approximately one year. Fully implemented on 2% of the US non-arable land area, this technology would produce enough combustible fuel to replace current gasoline consumption. With the potential to meet domestic oil needs and capture 50.8 million metric tons of CO<sub>2</sub> per year in the process, a relatively small scale implementation of our technology would establish a new industry for the State of Ohio that facilitates both energy and economic security for the country and reduces greenhouse gas emissions.

The University of Cincinnati and Heliotronic Energy Systems looks forward to participating in this program to promote technology-based economic development within Ohio.

Sincerely,

A handwritten signature in black ink, reading "Carlo Montemagno". The signature is written in a cursive style with a large, sweeping initial "C".

Carlo Montemagno, Ph.D  
Dean of Engineering and Applied Science  
Geier Professor of Engineering Education

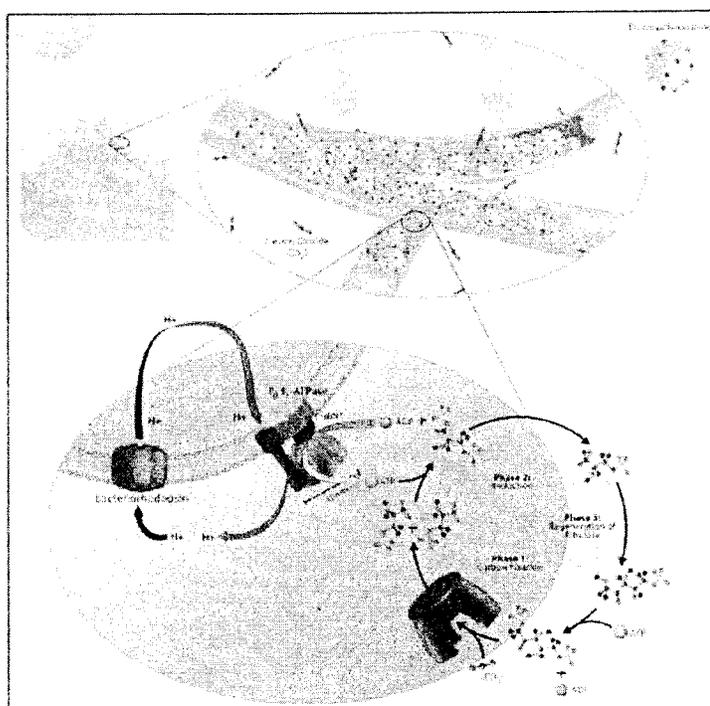
Attachment

## Nanoengineering the Production of Abiotic/Biotic Environmentally Sustainable and Economically Competitive Biofuels

**Key Scientific Fields:** Bionanotechnology, Systems Bioengineering, Bioenergy, Biofuels

We have engineered and are commercializing a carbon fixation/energy production platform using a novel nanoengineered system that is composed of a unique molecular assembly of stable proteins that mimic the natural photosynthetic process with unparalleled efficiency. This energy production system as currently demonstrated is almost twice as efficient as the best plant or biomass production method to date. Furthermore, the process is inexpensive; at the current state of development the liquid fuel is produced at a cost of \$2.44 per gallon of gasoline equivalent. With further development this technology has the potential of producing fuel

at a cost of less than 75 cents per gallon of gasoline equivalent. The capital plant costs have an estimated payback of approximately one year. Fully implemented on 2% of the US non-arable land area, this technology would produce enough combustible fuel to replace current gasoline consumption. With the potential to meet domestic oil needs and capture 50.8 million metric tons of CO<sub>2</sub> per year in the process, a relatively small scale implementation of our technology would establish a new industry for the State of Ohio that facilitates both energy and economic security for the country and reduces greenhouse gas emissions.



This novel technology is founded on two innovations, functional bubble architecture and biofunctional polymersomes. This simple energy production system uses 70 nm sized biosolar polymer vesicles integrated and packaged within a bioprotective foam. Solar energy is converted into chemical energy which in turn powers an enzyme reaction to capture carbon from CO<sub>2</sub>. The captured carbon molecules are then rearranged resulting in the formation of hydrocarbons, i.e. biofuel. The enzyme-infused bubble architecture represents a novel artificial photosynthetic carbon fixation pathway that converts in excess of 90% of the captured light into fuel. This proposal is directed at translating the lab scale technology into a pilot-scale demonstration facility.

**McKay, Michael J.**

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**OTFWPP 11-404**

**From:** Baumgartner, Eric [e-baumgartner@onu.edu]  
**Sent:** Tuesday, November 23, 2010 3:13 PM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** ONU Wright Projects LOI 2010\_11\_23.pdf

Please find attached a Letter of Intent for the Ohio Third Frontier Wright Projects Program.

Regards,  
Eric

-----  
Eric T. Baumgartner, Ph.D.  
Dean, T. J. Smull College of Engineering  
Ohio Northern University  
525 S. Main St.  
Ada, OH 45810  
Phone: (419) 772-2372  
Fax: (419) 772-2404  
e-mail: [e-baumgartner@onu.edu](mailto:e-baumgartner@onu.edu)  
web: <http://www.onu.edu/engineering>  
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OHIO NORTHERN UNIVERSITY

T. J. SMULL COLLEGE OF ENGINEERING

November 23, 2010

The Ohio Department of Development  
Technology and Innovation Division  
77 South High St., 25th Floor  
Columbus, OH 43215

RE: Ohio Third Frontier Wright Projects Program Letter of Intent

To Whom It May Concern:

This document is submitted as a Letter of Intent to apply to the Third Frontier Wright Projects program for Fiscal Year 2011. The preliminary proposal submission details are as follows:

Lead Applicant Organization: Ohio Northern University

Lead Applicant Address: 525 S. Main Street,  
Ada, OH 45810

Contact Person: Dr. Eric T. Baumgartner, Dean  
College of Engineering

Phone Number: (419) 772-2372

E-mail Address: e-baumgartner@onu.edu

Project Title: Enabling Flexible Fabrication and Robotic Assembly  
through Agile Manufacturing

Estimated Grant Funds: \$3,000,000

Known Collaborators: American Trim, Ohio Energy & Advanced Manufacturing  
Center, American Electric Power, Motoman

The concept of “agile manufacturing” was first formulated in 1991 by a group of industry experts who sought to describe the future of the manufacturing environment in the 21st century. However, the actual practical implementation of agile manufacturing has largely been focused on developing agility within the people and organizational processes that define the manufacturing environment as opposed to the development of the technology necessary to fully implement agile manufacturing systems that are truly responsive to rapidly changing, continually fragmenting, global markets. As such, the proposed project seeks to design, develop and commercialize an

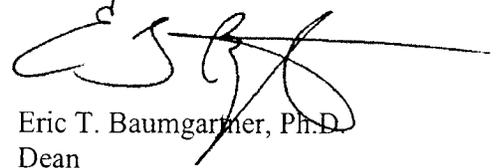
Arts & Sciences • Business • Engineering • Pharmacy • Law

525 SOUTH MAIN STREET • ADA, OH 45810 • (419) 772-2031 • FAX: (419) 772-1932 • www.onu.edu

agile manufacturing system that is capable of achieving the flexible fabrication and robotic assembly of products that will be commercialized for the alternative and advanced energy market. Specifically, the proposed project will look to push the limits of state-of-the art manufacturing processes that seek to drive down the turn-around time required to develop complex structures and enclosures. The project will also develop capabilities associated with the autonomous robotic assembly of these structures using sensor feedback including vision sensors. The project team consists of experts within the fields of metal forming and coatings, robotics, manufacturing, and energy systems.

If you have any questions regarding this LOI submission, please do not hesitate to contact me at your earliest convenience.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eric T. Baumgartner', with a long horizontal flourish extending to the right.

Eric T. Baumgartner, Ph.D.  
Dean

**From:** Sharmila M. Mukhopadhyay [sharmila.mukhopadhyay@wright.edu]  
**Sent:** Wednesday, November 24, 2010 1:04 AM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** Wright Projects LOI\_Mukhopadhyay.pdf

Date: November 23, 2010

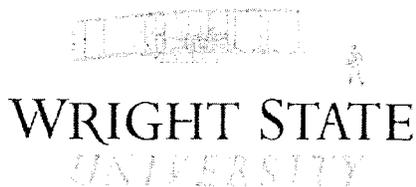
To: The Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25th Floor  
Columbus, OH 43215.

Dear Sir/Madam,

We hereby submit this Letter of Intent for the 2011 competition for the Ohio Third Frontier Wright Projects Program. Programmatic information of the intended proposal as well as a one-page summary is provided in the attachment. If you have any questions, or need any additional information, please let me know.

Sincerely,  
Sharmila M. Mukhopadhyay

.....  
Dr. Sharmila M. Mukhopadhyay  
Director, Center for Nanoscale Multifunctional Materials  
Professor of Mechanical & Materials Engineering  
Wright State University  
Dayton, OH 45435  
Tel: (937) 775-5092, Fax: (937) 775-5009  
Email: [Sharmila.Mukhopadhyay@wright.edu](mailto:Sharmila.Mukhopadhyay@wright.edu)  
URL: [www.cs.wright.edu/~smukhopa](http://www.cs.wright.edu/~smukhopa)



Center for Nano-Scale Multifunctional Materials  
College of Engineering & Computer Science  
3640 Colonel Glenn Hwy.  
Dayton, OH 45435-0001  
(937) 775-5040  
FAX (937) 775-5082

Dr. Sharmila M. Mukhopadhyay, Director  
smukhopa@wright.edu

Date: November 23, 2010

To: The Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25th Floor  
Columbus, OH 43215.

Re: Letter of Intent for 2011 Wright Projects

We hereby submit this Letter of Intent for the 2011 competition for the Ohio Third Frontier Wright Projects Program. Programmatic information of the intended proposal is provided here. A one-page summary is also attached.

Lead Applicant: Wright State University

Technical Contact: Sharmila M. Mukhopadhyay  
Director, Center for Nanoscale Multifunctional Materials  
Professor Mechanical & Materials Engineering  
Tel: (937) 775-5092 Fax: (937) 775-5082  
Email: smukopa@wright.edu

Project Title: **Commercialization of Porous Structures for Aerospace,  
Energy, Biological, and Environmental Applications**

Requested Grant Funds: \$1,000,000 (current estimate)

Known Collaborators: Wright State University, Air Force Institute of Technology,  
AFRL, Lockheed Martin, MetaMateria Technologies, Buckeye  
Composites

Project Summary Attached next page

Sincerely,

Sharmila M. Mukhopadhyay, Professor

## **Project Summary**

### **Commercialization of Porous Structures for Aerospace, Energy, Biological, and Environmental Applications**

The goal of this project will be to develop and commercialize devices and structures based on high porosity materials relevant to thermal, catalytic, clean energy and environmental applications. These seemingly diverse products have several common bottlenecks related to their uneven and multi-scale surface geometries that need careful tailoring. This group has a long history of research and development in this area.

To date, several products have been fabricated and demonstrated at laboratory scales. Wright Project funds will be used to improve and fine-tune the processes, and make them suitable for large-scale production. Examples of commercial products that are envisioned in the next three years include:

1. High thermal conductivity sheets of porous nano-carbon
2. Thermally responsive encapsulation structures for phase change materials
3. High surface area catalysts for water de-chlorination
4. Porous electrodes for fuel cells
5. Nano-structured hierarchical materials for bone healing/cell scaffolding
6. Nanostructures for hand-held pathogen detectors
7. Inexpensive porous ceramic structures for waste water treatments

Some unique and unprecedented hierarchical structures have been fabricated, tested and demonstrated suitable for the above applications. However, they have not yet been taken to the next step, where their properties can be exploited for societal use. At this time, more intense industry-laboratory collaborative efforts are needed to scale up these processes. Having the resources to do so can help bring these products to the market.

The proposal will describe in details the specific needs, and how they will be addressed by this team. New capabilities that will be set up include: (i) Fabrication facilities designed for faster production of porous structures, (ii) Multi-technique thermal testing, (iii) Micro-mechanical testing, (iv) Phase identification and crystal analysis, (v) Water quality testing, and (vi) Electrochemical evaluation. These new facilities will be leveraged with the multi-million dollar capabilities already available at the Center for Nanoscale Multifunctional Materials (CENSMM) at WSU, as well as product-specific facilities available at partnering institutions.

It is expected that collaborative use of infrastructure provided by this project will be beneficial for all partners: for-profit companies will have easy access to high-ticket laboratory facilities as well as novel ideas and research help from university personnel; non-profit academic and governmental laboratories will have the opportunity to develop their laboratory-scale research into commercial, military, and dual-use technologies.

**McKay, Michael J.**

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**OTFWPP 11-406**

**From:** Ganow, Scot [Scot.Ganow@udri.udayton.edu]  
**Sent:** Wednesday, November 24, 2010 12:52 PM  
**To:** OTFWPP2011  
**Cc:** Walters, Larrell; Groeber, Claudette M; Ganow, Scot  
**Subject:** UDRI Letter of Intent for: Ohio Third Frontier Wright Projects Program  
**Attachments:** 2011 OTFWPP LOI.pdf

The University of Dayton is pleased to submit the attached subject proposal. Please acknowledge receipt at your earliest convenience. Thank you.

**Scot Ganow, J.D., CIPP**  
Senior Contracts & Grants Administrator  
Registered Patent Attorney  
University of Dayton Research Institute  
937-229-2919  
[scot.ganow@udri.udayton.edu](mailto:scot.ganow@udri.udayton.edu)



24 November 2010

Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, OH 43215  
[OTFWPP2011@development.ohio.gov](mailto:OTFWPP2011@development.ohio.gov)

SUBJECT: Letter of Intent for 2011 Ohio Third Frontier Wright  
Projects, "Rapidly Deployable, Wide-Area Sensing System  
for Security Operations"

Dear Sir or Madam:

The University of Dayton is pleased to submit this Letter of Intent for the Fiscal Year 2011 Wright Projects Program Request for Proposal. The University of Dayton (UD), the Institute for the Development Commercialization of Advanced Sensor Technology (IDCAST) and collaborators, request consideration to submit a proposal in response to this RFP.

UD/IDCAST will be the lead applicant for the *Rapidly Deployable, Wide-Area Sensor System (RD-WASS) for Security Operations*. The total estimated grant funds requested for this effort are \$3,000,000, (\$2,500,000 in capital and \$500,000 in operating funds). The contact information for the lead applicant is as follows:

**Lead Applicant:** UD/IDCAST  
**Address:** 300 College Park, Dayton, OH 45469-0104  
**Administrative Contact:** Scot Ganow  
Sr. Contracts & Grants Administrator  
[scot.ganow@udri.udayton.edu](mailto:scot.ganow@udri.udayton.edu)  
(937) 229-2919  
**Technical Contact:** Larrell Walters, Division Head  
[Larrell.walters@udri.udayton.edu](mailto:Larrell.walters@udri.udayton.edu)  
(937) 239-5717  
**Proposed Project Title:** *Rapidly Deployable, Wide-Area Sensor System for Security Operations*

**Project Description:**

IDCAST will leverage existing and near-commercialization-ready sensor technologies from Ohio-based collaborators to produce an end-to-end surveillance solution for immediate proliferation into the commercial and civilian government security markets. IDCAST will

UNIVERSITY  
OF DAYTON  
RESEARCH  
INSTITUTE

Office of the Director  
300 College Park  
Dayton, OH 45469-0101  
(937) 229-2113  
FAX (937) 229-2888

merge the following existing sensor systems into a unique and affordable Rapidly Deployable, Wide-Area Sensor System (RD-WASS), with a single user interface:

1. Wide-Area Airborne Surveillance (WAAS) sensors
2. Wide-Area Ground Surveillance (WAGS) sensors
3. Megapixel Infrared (IR) Surveillance cameras
4. Local Area Ground Surveillance (LAGS)
5. Unattended Ground Sensors (UGS)
6. Chemical and Biological Sensors (CBS)
7. Region Wide Seamless and Wireless Sensor Network
8. Centralized Sensor Fusion and Command and Control
9. Distribution of Fused Information

Once established, the RD-WASS for Security Operations will become both a functional system that can be utilized by police, fire, and emergency response within Ohio and across the nation; and a Test Bed where new sensor technology can be evaluated and integrated into the RD-WASS. This project makes Ohio the center of attention with regard to layered sensing solutions in two ways. First, the RD-WASS will be a unique and very effective tool for government organization such as FEMA, Homeland Security, Border Protection, FBI, and the Secret Service. Whether it concern a natural disaster or providing increased awareness at a national level event or assisting in the resolution of criminal activity, the RD-WASS will provide an invaluable service. Second, as a test-bed the RD-WASS will be utilized to validated new sensor technology, new algorithms to exploit the information RD-WASS sensors collect, wide area information distribution methodologies, and command and control issues. With IDCAST serving the role equivalent to that of the "Underwriters Lab" for the RD-WASS, companies and universities from across the country will come to Ohio to validate their sensing technology in the RD-WASS test bed.

The primary technical objectives of this program are to finalized sensor developments, seamlessly integrate the different sensors to support command and control decision making, and then demonstrate the capability. It is the intention of the system to be able to support the capability to play all of the collected information forward and back to develop the history of the observed criminal activity before, during, and after the event. The Dayton Police Department will assist in the design and operational evaluation of the RD-WASS.

### **Personnel and Team Members**

This team of collaborators has worked together on different projects, but this is the first time all have participated in one program. The team has a great track record of success.

<b><u>Organization Name</u></b>	<b><u>Contribution and Expertise</u></b>
UD/IDCAST – Lead	Systems Integration, Sensor fusion
Persistent Surveillance Systems	Airborne Sensor array, Sensor Manufacturer, Integration
Defense Research Associates	Remote EO/IR Sensors the hangs from power lines
STAN Solutions	Seamless Wireless Sensing Networks and Giga-Pixel Sensor
L3-Com Nova Engineering	Novel Unattended Ground Sensors
L3-Comm Cincinnati Electronics	Infra-Red Technologies
Woolpert	Worldwide Wide Area Geo-Spatial Service

No Bull Innovation  
Air Force Research Laboratory  
City of Dayton

Novel Chemical or Biological Sensors  
Access to Expertise, Equipment, and Testing

The University of Dayton looks forward to participating in this program to promote technology-based economic development within Ohio.

Sincerely,



John E. Leland, Ph.D., P.E.

**McKay, Michael J.**

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**OTFWPP 11-407**

**From:** Vaze, Suhas [svaze@ewi.org]  
**Sent:** Wednesday, November 24, 2010 12:56 PM  
**To:** OTFWPP2011  
**Cc:** Tighe, Jim  
**Subject:** EWI Letter of Intent for 2011 OTFWPP [EWI Project 52851GTH]  
**Attachments:** EWI Letter of Intent [11-24-2010].pdf

Dear Sir/Madam:

Please find attached our letter of intent to submit a proposal in response to the Request for Proposals under the 2011 Ohio Third Frontier Wright Projects Program released October 20, 2010. Please do not hesitate to contact me with questions/comments.

Thanks.

Best Regards,

**Suhas Vaze, Ph.D., PMP**

**EWI, Lead Project Manager**

Mail: 1250 Arthur E. Adams Dr., Columbus OH 43221

Email: [svaze@ewi.org](mailto:svaze@ewi.org)

Phone: +1-614.688.5127

Cell: +1-614.441.6633



Via Email: OTFWPP2011@development.ohio.gov

November 24, 2010

Ohio Department of Development  
Technology and Innovation Division, Attn: OTFWPP  
77 South High Street, 25th Floor  
Columbus, OH 43215

**Subject: 2011 OTFWPP LOI II  
EWI Proposal No. 52851GTH, "Development of Advanced Hot Forming Capability for  
Automotive and Aerospace Structural Components"**

Dear Sir/Madam:

Please accept this as EWI's Letter of Intent to submit a proposal in response to the Request for Proposals under the 2011 Ohio Third Frontier Wright Projects Program released October 20, 2010.

Proposed Lead Applicant:

EWI, Inc.  
1250 Arthur E. Adams Drive  
Columbus, Ohio 43221  
Tel: 614.688.5000  
Contact Person: Suhas Vaze  
Contact Tel: 614.688.5127  
Contact Email: svaze@ewi.org

Proposal Title: Development of Advanced Hot Forming Capability for Automotive and Aerospace Structural Components

Estimated Grant Funds Requested: \$1.1 million in State funding [EWI and its collaborators plan to post \$1.2 million in cash and in-kind cost share for a total \$2.3 million effort]

Known Collaborators:

The Ohio State University – Center for Precision Forming (OSU-CPF)  
339 Baker Systems  
1971 Neil Avenue  
Columbus, Ohio 43210-1271  
Contact Person: Taylan Altan, Professor & Director  
Tel: 614.292.5063  
Email: altan.1@osu.edu

## Project Summary

EWI will serve as both administrative and technical director of the project. EWI, in this capacity, intends to commit together with the program collaborators cost share of approximately \$1.2M over a 3-year period, as set forth in our proposal.

EWI, in collaboration with The Ohio State University – Center for Precision Forming (OSU-CPF) and other industry partners, including the OEMs of automotive, aerospace, and heavy manufacturing, Tier 1 and 2 suppliers, equipment manufacturers, material suppliers, and a modeling software supplier have formed an exceptionally strong team suited for developing and commercializing advanced hot forming processes and materials. The EWI/OSU team intends to propose an Ohio Third Frontier Wright Project to establish a state-of-the-art hot forming development capability in Ohio. This capability will allow manufacturers to optimize the final properties of hot-formed parts and tooling design to enable streamlined implementation of the hot forming process for a wide range of components for reducing total life cycle costs. To achieve this goal, the project will develop numerical modeling tools to optimize hot forming materials, tooling designs, and part properties. The project will also establish a servo-motor-control pressing (SMCP) hot forming test facility at EWI. This capability will be demonstrated by modeling, fabricating prototype tooling, and optimizing SMCP hot forming processing conditions to produce example components.

The project will leverage the extensive technical capabilities and proven track-record of EWI and OSU in the development of leading-edge manufacturing technology and transitioning the technology to Ohio manufacturers.

It is expected that the development of advanced hot forming technologies can increase the capabilities and competitiveness of Ohio's manufacturing companies, which will create new manufacturing jobs.

Sincerely,



Dr. Suhas P. Vaze  
Lead Project Manager  
EWI

Cc: James P. Tighe  
CFO and Vice President of Administrative Services  
EWI

Taylan Altan, Professor & Director  
The Ohio State University – Center for Precision Forming (OSU-CPF)

**From:** fraser@matsceng.ohio-state.edu on behalf of Hamish Fraser [fraser@matsceng.ohio-state.edu]  
**Sent:** Monday, November 29, 2010 12:56 AM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** OTF\_LOI\_2010\_final.pdf; ATT00001.htm

The prospective Lead Applicant's name: The Ohio State University

Lead Applicant's address: 2041 College Road, Columbus, OH 43210

Lead Applicant's phone number: (614) 292-2708

Lead Applicant's contact person: Dr. Hamish L Fraser ([fraser.3@osu.edu](mailto:fraser.3@osu.edu))

Proposed Project title: Center for the Automated Characterization and Modeling of Nano-scaled Materials and Microstructures

Estimated Grant Funds to be requested: \$3,000,000

Known Collaborators: FEI Company

One page summary of the proposed project:

The plan of this proposed center is to establish the first facility in the world for the automated characterization and modeling of nano-scaled materials and microstructures. This center of excellence will provide solutions to three important technology gaps in nano-technology, involving *characterization*, *standardization* and *expertise*. These gaps severely limit current research and development (R&D) and hence commercialization opportunities in a number of significant economic sectors. In so doing, it will establish itself as the premier institution internationally for advanced characterization of nano-scaled materials, an enabling technology, and by coupling with one of its major commercialization partners, the FEI Company, will establish a vibrant and profitable entity in Columbus.

A major focus will be on the development and commercialization of automated characterization tools for biomedical applications, not only scientifically important, but also potentially extremely attractive regarding successful commercialization. Automated characterization of nano-particulate used for drug delivery to tumors will permit a major contribution to be made to the *elimination of suffering and death from cancer by 2015* (a stated aim of the National Cancer Institute). Concurrent to that effort, the proposed center aims to provide solutions to two of the technology gaps, namely *characterization* and *standardization*, which are currently impeding scientific and social developments in a number of areas of importance to Ohio's economy. The solutions require an integration of advanced and automated materials characterization, software engineering, and modeling and simulation. The enabling technologies developed will be applied in a number of commercial opportunities across a wide variety of economic sectors, and will play a pivotal role in enabling Ohio's significant investment in nano-technology.

The application of new and improved materials in components traditionally involves significant costs and lengthy timeframes, severely restricting the competitiveness of many Ohio companies involved in aerospace, automotive, energy, electronics, and consumer products. The solution to this problem involves an integration of characterization and modeling to permit accelerated materials insertion at lower costs. Such integrated tools for the prediction of properties of nano-scaled materials and microstructures, to be developed and commercialized in the proposed center, will contribute effectively to increasing the competitiveness of a large number of companies in major sectors of Ohio's economy.

The proposed structure of the center is designed to impact markedly the very significant investment in nano-scaled materials and microstructures that is currently being made by governmental entities and private companies in the State of Ohio. In addition to its focused research, development and commercialization activities, the proposed center will establish and operate an Extramural Research and Training Institute. This institute will

have three important functions, offer training to scientists and engineers in the new technologies and methodologies, and hence address the *expertise* gap, offer access to these new characterization and modeling tools, in the center or via the Third Frontier Network, and undertake research projects for entities that do not possess the appropriate research infrastructure. In this way, a very large part of Ohio's industrial sectors will be impacted by the proposed center.

The prospective Lead Applicant's name: The Ohio State University  
Lead Applicant's address: 2041 College Road, Columbus, OH 43210  
Lead Applicant's phone number: (614) 292-2708  
Lead Applicant's contact person: Dr. Hamish L Fraser ([fraser.3@osu.edu](mailto:fraser.3@osu.edu))  
Proposed Project title: Center for the Automated Characterization and Modeling of Nano-scaled Materials and Microstructures  
Estimated Grant Funds to be requested: \$3,000,000  
Known Collaborators: FEI Company

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**From:** Norfolk, Mark [mnorfolk@ewi.org]  
**Sent:** Monday, November 29, 2010 10:47 AM  
**To:** OTFWPP2011  
**Cc:** Graff, Karl; Marcelo Dapino  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** EWI USAM Letter of Intent FINAL.pdf

November 29, 2010

Ohio Department of Development, Technology Division  
77 S. High St., 25th Floor  
Columbus, OH 43216-1001

**Subject:** Letter of Intent – Wright Project

To Whom It May Concern:

This letter provides notice of intent for Edison Welding Institute (EWI) to submit a proposal in response to the Wright Projects RFP released October 20, 2010.

**Prospective Lead Applicant:** Edison Welding Institute, Inc; 1250 Arthur E. Adams Drive;  
Columbus OH 43221; 614.688.5000

**Contact Person:** Mark Norfolk; [mnorfolk@ewi.org](mailto:mnorfolk@ewi.org) 614.688.5223

**Project Title:** Development of a hybrid process based on Ultrasonic Additive Manufacturing and Laser Machining for realization of novel smart structures

**Funds Requested:** Requesting a \$3 million effort, with \$1.5 million in State funding.

**Collaborators:** EWI will be working in collaboration with The Ohio State University, Solidica Corporation (original developer of the technology), VHP Inc. (commercialization entity for the technology) and a group of end-user manufacturers seeking to capitalize on this innovative manufacturing technology

**Summary:** In a prior Wright Project, a team led by EWI successfully developed a new manufacturing process called Very High Power Ultrasonic Additive Manufacturing (VHP UAM), and has initiated its commercialization. Recent research with the technology has shown a large untapped potential in integrating smart materials with the VHP UAM process to create high value smart structures and systems such as embedded switches, sensors, and active stiffness control devices. In this project a new hybrid process based on UAM and Laser Machining will be created that will allow the embedding of smart materials into bulk metals at multiple scales from sub-millimeter to meter sizes.. This significant advancement of the VHP UAM process will greatly accelerate the range of applications and commercial markets into new fields such as fluidic devices, frequency agile antennas and in situ sensors.

Sincerely,



**Mark Norfolk, PE**

**EWI, Project Manager, Advanced Energy**

Mail: 1250 Arthur E Adams Dr, Columbus Oh 43221

Email: [mnorfolk@ewi.org](mailto:mnorfolk@ewi.org)

Phone: 614.688.5223 Cell: 614.353.2683



November 29, 2010

Ohio Department of Development, Technology Division  
77 S. High St., 25th Floor  
Columbus, OH 43216-1001

**Subject: Letter of Intent – Wright Project<sup>1</sup>**

To Whom It May Concern:

This letter provides notice of intent for Edison Welding Institute (EWI) to submit a proposal in response to the Wright Projects RFP released October 20, 2010.

**Prospective Lead Applicant:** Edison Welding Institute, Inc; 1250 Arthur E. Adams Drive; Columbus OH 43221; 614.688.5000

**Contact Person:** Mark Norfolk; [mnorfolk@ewi.org](mailto:mnorfolk@ewi.org) 614.688.5223

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**Summary:** In a prior Wright Project, a team led by EWI successfully developed a new manufacturing process called Very High Power Ultrasonic Additive Manufacturing (VHP UAM), and has initiated its commercialization. Recent research with the technology has shown a large untapped potential in integrating smart materials with the VHP UAM process to create high value smart structures and systems such as embedded switches, sensors, and active stiffness control devices. In this project a new hybrid process based on UAM and Laser Machining will be created that will allow the embedding of smart materials into bulk metals at multiple scales from sub-millimeter to meter sizes.. This significant advancement of the VHP UAM process will greatly accelerate the range of applications and commercial markets into new fields such as fluidic devices, frequency agile antennas and in situ sensors.

Sincerely,

Mark Norfolk, PE

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<sup>1</sup> Submitted by e-mail to [OTFWPP2011@development.gov](mailto:OTFWPP2011@development.gov) with "2011 OTFWPP LOI" in the subject line.

**Hansen, Andrew**

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**OTFWPP 11-410**

**From:** Kevin Passino [passino@ece.osu.edu]  
**Sent:** Monday, November 29, 2010 11:30 AM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** LOI-OTFWPPsmartgrid.pdf; ATT00001.htm; image001.gif; ATT00002.htm

To Whom it May Concern:

Attached please find a .pdf file of our letter of intent for the OTF WPP.

I also pasted the text of the file below in case there was a problem with the file.

Kevin Passino

Letter of Intent

Ohio Third Frontier, Wright Projects Program

**Center for the Smart Electrical Grid**

**Lead Applicant: The Ohio State University**

Contact: Kevin M. Passino

Dept. Electrical and Computer Engineering

The Ohio State University

2015 Neil Ave., Columbus OH 43210

614-312-2472, passino@ece.osu.edu

Estimated Funds Requested: \$3M

Collaborators:

The Ohio State University

Greenfield Solar Corp

Emerson/Liebert Corp.

Eaton Corp.

Rockwell Automation

EMTEC

Hull and Associates

American Electric Power

Dayton Power and Light

## Summary of Proposed Project

The integration of cyber-age information technologies into the electrical grid in the US will offer significant improvements in reliability and efficiency of delivery of electrical power to commercial and residential sites. Smart information-technology based management of load will offer the customer the ability to massage their load profile to minimize costs (e.g., by “shaving” peak demand by orchestrating when customer devices are turned on and off). The smart grid will be able to dynamically reconfigure in the case of failures (e.g., lightning strikes) to ensure continuous high quality power supply. Moreover, the grid will be able to accept power from not only the traditional central power plant, but also alternative renewable energy sources (e.g., solar, wind).

The proposed project is to build a smart electrical grid at Ohio State University as a testbed for the commercialization of smart grid technologies. The testbed will have three main components. First, there will be a smart electrical grid in a building that will hold smart meters, a communication network, and digitally controlled circuit breakers and relays. There will be an interface to an array of solar collectors (from collaborator Greenfield Solar), a wind turbine, battery storage, and an interface to the grid. There will be a power management center for managing flow of power from the photovoltaic and wind sources, battery, and grid. There will be a “dynamic load bank” that can simulate a range of customer loads (e.g., residential, commercial). The testbed will allow for the study of a range of functionalities, including (i) optimal energy flow control based on pricing and demand, (ii) voltage and VAR control, (iii) load management, (iv) dynamic islanding, (v) communication network evaluation, (vi) power quality control, and (vii) evaluation of distributed control in the smart grid.

The second component of the smart grid testbed will reside in OSU’s High Voltage Laboratory and will hold a smart grid observation room (for high level monitoring and control), and a components level testbed (e.g., for high voltage and high power tests for switching gears, inverters/converters, fuel cells, and batteries). The third component of the smart grid testbed will be a simulation testbed for power systems and power electronics.

The proposed program will focus on the commercialization of two technologies. First, the smart grid testbed will be used for testing and commercialization of a new concentrated photovoltaic (CPV) system by Greenfield Solar Corp. GreenField’s unique system, the StarGen™, incorporates proprietary high performance PhotoVolt™ solar cells, and has achieved proven technical viability and market acceptance. GreenField is positioned to significantly enhance Ohio’s growing portfolio of solar energy companies, and completion of this project will add thermal energy recovery for a combined heat and power product. The second product that will be tested and commercialized via the testbed is an Emerson/Liebert uninterruptible power supply (UPS). This product will be used directly with the Greenfield CPV for integration into the smart grid.

**Hansen, Andrew**

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**From:** Xiangwu Zeng [xxz16@case.edu]  
**Sent:** Monday, November 29, 2010 12:02 PM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** Offshore\_Foundation\_OTFWP\_LOI.docx

Dear Ohio Department of Development:

Attached please find the LOI from Case Western Reserve University for our 2011 Wright Projects Program proposal.

Sincerely,

David Zeng

--

David Zeng, Ph.D.  
Frank H. Neff Chair Professor and Chairman  
Dept. of Civil Engineering  
Case Western Reserve University  
10900 Euclid Avenue  
Cleveland, OH44106-7201  
Phone: 216-368-2923; Fax: 216-368-5229



November 30, 2010

Dear Ohio Department of Development,

Please accept this Letter of Intent (LOI) from Case Western Reserve University (CWRU) for our 2011 Wright Projects Program proposal.

**Lead Applicant's Name:** Case Western Reserve University (CWRU)  
**Address:** Great Lakes Energy Institute (GLEI) at CWRU  
10900 Euclid Avenue, Olin 305  
Cleveland, Ohio 44106  
**Telephone:** (216) 368-2923  
**Contact Person:** Dr. Xiangwu (David) Zeng  
**Contact Email:** xxz16@case.edu

**Proposed Project Title:** Ohio Center for Offshore Wind Foundations (Ohio-COWF)

**Estimated Grant Funds to be Requested:** \$3 Million (\$2.5 WCF / \$500K R&DF)

**Known Collaborators:** Great Lakes Wind Energy, LLC (GLWEnergy)

### Project Summary

Great Lakes Wind Energy, LLC (GLWEnergy) will soon install a 5-turbine, 20MW offshore wind farm in Lake Erie. The *Lake Erie Demonstration Project* will be the first operational in the United States and will pave the way for GLWEnergy to develop 1000MW of wind power in Lake Erie by 2030. The result will create an estimated \$7.8 billion of economic impact and 8000 or more jobs. In order to help Ohio businesses capitalize on this opportunity, GLWEnergy has chosen to collaborate with Case Western Reserve University (CWRU) and its partners in this proposed Ohio Third Frontier Wright Project (WP), which CWRU will lead. The project will conduct commercially-focused research on the very first foundation of the *Demonstration Project* – which GLWEnergy is committed to installing in the near future – in order to make offshore wind power in Lake Erie even more lucrative. In the long term, the project – which will impact Ohio construction, marine, engineering design, and technology companies, as well as its top research institutions – will establish the first foundation installed in the U.S. as a research hub for offshore wind foundation and deployment expertise in Ohio.

To maximize the impact, a collaborative, led by Civil Engineering expertise at Case Western Reserve University, and their industry partners (including GLWEnergy) propose to be the team to construct, fully-instrument, install, and conduct commercially-focused, long-term research on this first 4MW foundation. The result will be the creation of the Ohio Center for Offshore Wind Foundations (Ohio-COWF), which will serve the state for decades. Over the next six years, effort at the Center will produce more efficient and cost-effective offshore wind foundations – first tailored to Lake Erie, and then optimized for similar environments across the region.

The cost of a foundation alone contributes 25% to the overall cost of an offshore turbine. A foundation further represents the greatest technological challenges and unknowns facing offshore development. Both factors drive up the cost of electricity produced, and thus drive down the competitiveness of offshore wind. However, by being “first-to-water,” GLWEnergy’s foundation offers unique research and development opportunities that can mitigate this problem before full-scale demonstration occurs. It also offers those who design, fabricate, deploy, and install it an immense and immediate commercial advantage: the opportunity to secure, before any other regional team, the credibility to locally serve the foundation needs of several multi-MW offshore projects planned for the Great Lakes in the next five to ten years. These projects represent hundred-million to billion dollar investments, with the totality of their foundation,



deployment, and installation work potentially attributing up to as much as half. To understand the true scale of this opportunity, it is valuable to note that the National Renewable Energy Laboratory (NREL) recently estimated the offshore wind potential of the Great Lakes region at 70GW of capacity. Further calculation values this above \$250B.

Beyond initial impact, the long-term use of WP capital to enhance other applied research, development, and demonstration programs include the verification of new, experimental technologies for offshore wind and a platform for studying the long term impact of offshore development on the environment, including birds and fish in the lake. It will also allow university members to conduct further, unique studies of relevance. This includes dynamic loading generated by extreme natural forces such as storms and earthquakes that can cause the failure of all types of marine structures. Potentially, the Center could also provide value to non-wind foundation projects in-water, including dock, port, and bridge improvements in the Great Lakes. This project will also use OTF support to promote educational and training programs for technical workers and students in the targeted technology areas. This will include undergraduate and graduate students at participating universities in foundation engineering, wind energy, and construction engineering.

The total budget requested for this WP is \$3 million. This investment from the State of Ohio will be leveraged by an even more significant investment from the partners of this proposal, including several million more in cash dollars for the construction of the first offshore foundation and the Center it will create. In all, the Ohio-COWF thus provides the State with the opportunity for an extended investment - one that can create an ongoing impact to the largest growing alternative energy industry in the region and on the advancement of a new workforce in Ohio.

**Hansen, Andrew**

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**OTFWPP 11-412**

**From:** Tom Kornacki [tkornac@bgsu.edu]  
**Sent:** Monday, November 29, 2010 12:22 PM  
**To:** OTFWPP2011  
**Cc:** Michael Y Ogawa; Robert Michael McKay; George S Bullerjahn  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** BGSU AVS LOI Wright Project 2011.pdf

Attached is BGSU's Letter of Intent for the 2011 Wright Project Program.

Tom Kornacki  
Acting Director  
Sponsored Programs & Research  
Bowling Green State University  
106 University Hall  
Bowling Green, OH 43403  
419-372-2481



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Office of the Founding Vice President for Research  
and Economic Development

November 24, 2010

Ohio Department of Development  
Third Frontier Project

Bowling Green State University and Algaeventure Systems intend to submit a proposal to the 2011 Wright Projects Program competition. Our proposal will be entitled:  
**“Remediation technologies for abatement of toxic algal blooms.”**

Estimated funds requested: \$1,200,000

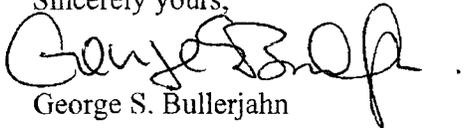
Lead institution for the project: Bowling Green State University, Office of Sponsored Programs and Research, University Hall, Bowling Green OH 43403

Contact persons: Profs. George S. Bullerjahn and R. Michael McKay, Department of Biological Sciences, Bowling Green State University.

Phone and email: Prof. George Bullerjahn (419) 372-6873, bullerj@bgsu.edu

The Project Summary for our proposal is provided on the following page.

Sincerely yours,

  
George S. Bullerjahn

  
R. Michael McKay

**Project Summary: Remediation technologies for abatement of toxic algal blooms.**

In the past decade, Ohio's freshwater lakes and reservoirs have been increasingly influenced by harmful cyanobacterial blooms. These organisms, commonly known as blue-green algae, deteriorate water quality by producing a variety of potent toxins that contribute to fish kills, beach closings and human contact advisories. Many other bloom-forming cyanobacteria produce metabolites that generate taste and odor problems for citizens depending on reservoirs as their water supply. Overall, toxic cyanobacteria are a serious threat to the tourism industry in the state. Affected sites include the Lake Erie shoreline and islands, as well as Grand Lake St. Marys (GLSM). For example, a cyanobacterial bloom of *Microcystis* spp., *Planktothrix* spp. and *Aphanizomenon* spp. resulted in the total collapse of the \$160 million summer tourism industry at Grand Lake in 2010. Clearly, technologies need to be developed that can help reverse this trend.

One such remediation solution was provided by scientists at Bowling Green State University and Algaeventure Systems (AVS). Given the nutrient status of many lakes and the continued loading of nutrients from surrounding agricultural lands and urban areas, it is often impossible to prevent algal blooms from occurring. We have conducted experiments to determine whether the algal community in lakes can be shifted from cyanobacteria to a benign community dominated by diatoms. Diatoms are eukaryotic algae that have a silica cell wall, and thus amendment of lake water with silica can enhance the growth of a small, but detectable endemic diatom population. Provided with this nutrient, they can outcompete the toxic cyanobacteria, yielding a water supply free from toxins and taste/odor issues. Pilot experiments under laboratory conditions have provided data showing a positive response from the diatom community at the expense of the cyanobacterial assemblage. A diatom bloom may also provide a secondary benefit by producing biomass suitable for biofuel/bioplastics production or gas production by anaerobic digestion. Thus, we have partnered with AVS (Marysville, OH) to determine whether their proprietary algal harvesting systems can be adapted to retrieve algae so that they may test the biomass for potential biomass product development. Our project will be based at GLSM, with the goal that the technologies developed are applicable in other aquatic systems, such as Lake Erie, that are affected by toxic cyanobacteria. Addressing the impact of noxious cyanobacterial blooms on Lake Erie is particularly important considering the almost \$11 billion in annual revenue from tourism and recreation associated with the lake. Our proposed work in GLSM will offer important proof of concept – while reaping regional economic benefits - before extending the approach to Lake Erie.

The aim of our project is threefold: first, to test several treatment strategies to determine the ideal physical and chemical formulation of silica to promote diatom growth; second, to develop an optimal method for converting the silica to this ideal formulation; and third, to test the efficiency of the algal harvesting systems in a large-scale system such as GLSM (5,500 hectares). Our intent is to rapidly commercialize the silica formulations and delivery methods. These aims will contribute to economic development in Ohio by developing proprietary methods and equipment to remediate bloom-affected waters, and by helping to restore a viable tourism industry to sites most strongly influenced by toxic cyanobacteria.

**Hansen, Andrew**

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**From:** Inder Jeet "Jiti" Gupta [gupta.11@osu.edu]  
**Sent:** Monday, November 29, 2010 12:23 PM  
**To:** OTFWPP2011  
**Cc:** Jim Ball; dbrzezinska@osu.edu  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** LOI\_Ohio-State\_Gupta JFB.pdf

Sir / Madam;

We plan to submit a proposal under 2011 Ohio Third Frontier Wright Project Program. Attached is our Letter of Intent for the same. Thanks!

Inder Gupta

---

*Inder J. Gupta, Ph.D.  
Research Professor  
Electrical & Computer Engineering Department  
The Ohio State University  
ElectroScience Laboratory  
1320 Kinnear Road, Columbus, OH 43212-1191  
Phone: 614-292-5951; Mobile: 614-657-2952  
Email: [gupta.11@osu.edu](mailto:gupta.11@osu.edu); Fax: 614-292-7297*

**Letter of Intent  
Ohio Third Frontier Wright Project Program  
Fiscal Year 2011**

**Lead Applicant's Name:** The Ohio State University  
**Lead Applicant's Address:** Engineering Research Services  
2036 Neil Avenue, Room 224  
Columbus, OH 43210  
**Lead Applicant's Phone:** 614-292-4903

**Contact Person:** James F. Ball  
**Contact Person's Email:** [ball.6@osu.edu](mailto:ball.6@osu.edu)

**Proposed Project Title:** Center for Calibration, Development and Testing of Navigation,  
Timekeeping and Geo-location Systems

**Estimated Funds to be Requested:** \$3,000,000.

**Known Collaborators:** Northrop Grumman Corporation  
Electronic Systems – Xetron  
Cincinnati, Ohio

L3 Communication – Nova Engineering  
Cincinnati, Ohio

Air Force Institute of Technology (AFIT)  
Wright Patterson AFB, Ohio

Air Force Research Laboratory  
Sensors Directorate  
Wright Patterson AFB, Ohio

## Project Summary

Inder J. Gupta / Dorota Brzezinska

Navigation, timekeeping and mapping (geo-spatial intelligence and data acquisition) are extremely important for US economy and technical dominance. In the last two decades, Global Positioning System (GPS) has become the de facto system of choice for navigation, timekeeping and mapping. The importance of GPS to the United States is well stated in the following quote from 2005 Defense Science Board study, The Future of the Global Positioning System:

*“GPS is vital to the United States and to the DoD because, as a fundamental information system it provides a common thread of precise position and time throughout our national security and economical infrastructures. This global, seamless service is invaluable for safe and efficient movement, measurement, and tracking of people, vehicles, and other objects anywhere from the earth’s surface to geosynchronous orbit, as well as providing timing and synchronization for global communications, electronic transactions of all types, and power distribution networks.”*

GPS although a very reliable system, is not available and/or may not provide the desired accuracy in many situations that includes urban canyons, RF challenged environments, inside buildings, etc. To get around these shortcomings, currently, GPS is being integrated with other sensors. These sensors include (but are not limited to) inertial measurements units (IMU), electro-optical sensors, LiDAR (Light Detection and Ranging), barometers, magnetometers, etc. The state-of-the-art navigation, timekeeping and mapping systems, thus, are a suite of sensors. For timely development and marketing of these systems, one needs efficient calibration and testing facilities. For year around use, these facilities should be indoors but should be able to simulate the real world scenarios, and should be equipped with a variety of calibration targets and scenarios, as well as data storage and replay capabilities. These facilities should have their own GPS reference receivers, ultra-wideband transmitters and receivers, truth reference systems, rate tables, camera and LiDAR calibration ranges, two-way time transfer responders, local networks for position testing, multi-constellation, multi-frequency GPS signal simulator. A roller coaster for dynamic calibration and testing will also be highly desirable.

Under the proposed research grant, we will develop a center for calibration and testing of multi-sensor navigation, timekeeping and mapping systems. The center will be open to Ohio-based for profit companies to test and develop their new products. We will also provide expertise to these companies in the areas of algorithm development for optimum sensor integration and product performance enhancement. The ultimate goal of the center will be to make Ohio industry lead in this important technology. The center will also be training and educating undergraduate and graduate students in these fields. This way we will provide well trained employees for Ohio-based navigation, timekeeping and mapping industry.

**From:** Kraft, Frank [kraftf@ohio.edu]  
**Sent:** Monday, November 29, 2010 12:22 PM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** F.Kraft 3rd Frontier Wright LOI.docx

Lead Applicant and Contact Person:

Dr. Frank F. Kraft, Associate Professor and Graduate Chair Department of Mechanical Engineering Russ College of Engineering and Technology Ohio University  
255 Stocker Center  
Athens, OH 45701

Phone number: (740) 597-1478  
e-mail: [kraftf@ohio.edu](mailto:kraftf@ohio.edu)

Project Title: Copper Multi-Channel Tube Manufacturing for High-Efficiency HVAC/R Systems

Estimated Grant Funds Requested: \$200,000

Collaborators: International Copper Association

Project Summary:

The goal of this project is to establish medium-scale manufacturing of new products used in systems related to energy efficiency and environmental control. The new products are precision, thin-walled tubes, with multiple small channels, made from high-conductivity copper. They will be used in widespread applications, such as high-efficiency environmental control systems which involve heat exchangers. These applications include not only refrigeration systems, air conditioning, and heat pumps, but also other non-conventional applications (a multibillion dollar global market). High-end markets include the healthcare and food sectors, where the anti-microbial and mold suppression properties of copper provide distinct benefits.

The overall scope of the project is to procure, develop and install the equipment needed for a medium volume production process to produce precision copper multi-channel tubing. A lab-scale process has already been developed and proven successful at Ohio University, and several prototype heat exchangers have been manufactured for testing. U.S. and international patent applications have been filed by Ohio University for this process technology. Such a facility will be used to perform process research and development, to train university students and industry personnel engaged in this new technology, and to develop further intellectual property related to this process.

This project has significant potential to create and keep high-tech manufacturing jobs based in the Appalachian region of southeastern Ohio. These jobs would include production personnel, machinists, engineering staff, and administrative staff.

**Lead Applicant and Contact Person:**

Dr. Frank F. Kraft, Associate Professor and Graduate Chair  
Department of Mechanical Engineering  
Russ College of Engineering and Technology  
Ohio University  
255 Stocker Center  
Athens, OH 45701

Phone number: (740) 597-1478  
e-mail: [krafft@ohio.edu](mailto:krafft@ohio.edu)

**Project Title:** Copper Multi-Channel Tube Manufacturing for High-Efficiency HVAC/R Systems

**Estimated Grant Funds Requested:** \$200,000

**Collaborators:** International Copper Association

**Project Summary:**

The goal of this project is to establish medium-scale manufacturing of new products used in systems related to energy efficiency and environmental control. The new products are precision, thin-walled tubes, with multiple small channels, made from high-conductivity copper. They will be used in widespread applications, such as high-efficiency environmental control systems which involve heat exchangers. These applications include not only refrigeration systems, air conditioning, and heat pumps, but also other non-conventional applications (a multibillion dollar global market). High-end markets include the healthcare and food sectors, where the anti-microbial and mold suppression properties of copper provide distinct benefits.

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This project has significant potential to create and keep high-tech manufacturing jobs based in the Appalachian region of southeastern Ohio. These jobs would include production personnel, machinists, engineering staff, and administrative staff.

**Hansen, Andrew**

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**OTFWPP 11-415**

**From:** Michael Crifasi [mac302@case.edu]  
**Sent:** Monday, November 29, 2010 12:53 PM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI\_CWRU\_Utility-scale Multi-megawatt Near-shore Wind Farm  
**Attachments:** 2011 OTFWPP LOI\_CWRU\_Utility-scale Near-shore Wind Farm.pdf

Dear Ohio Department of Development and Ohio Third Frontier,

Please accept our Letter of Intent for the 2011 Wright Projects Program, entitled "Experimental Utility-scale Multi-megawatt Near-shore Wind Farm for Advanced Research and Power Generation – Wind Energy and Control Systems Center." Case Western Reserve University will be the lead applicant. Dr. Mario Garcia-Sanz ([mario@case.edu](mailto:mario@case.edu)) will be the contact person.

Thank you, and we look forward to submitting a full proposal.

--  
Michael Crifasi  
Proposal Developer  
Great Lakes Energy Institute  
Case Western Reserve University  
Email: [michael.crifasi@case.edu](mailto:michael.crifasi@case.edu)  
Phone: (216) 368-0091



November 29, 2010

Dear Ohio Department of Development,

Please accept this Letter of Intent (LOI) from Case Western Reserve University (CWRU) for our 2011 Wright Project proposal.

**Lead Applicant's Name:** Case Western Reserve University  
**Address:** 2095 Martin Luther King Jr. Drive, Nord 500  
Cleveland, Ohio 44106  
**Telephone:** (216) 368-5122 (Dr. Garcia-Sanz)  
**Contact Person:** Dr. Mario Garcia-Sanz  
**Contact Email:** mario@case.edu

**Proposed Project Title:** Experimental Utility-scale Multi-megawatt Near-shore Wind Farm for Advanced Research and Power Generation – Wind Energy and Control Systems Center

**Estimated Grant Funds to be Requested:** \$3 Million

**Known Collaborators:** Great Lakes Towing Company, MT Energy USA

### Project Summary

Wind power has taken hold in Ohio and along its manufacturing supply chain. Many companies realize this potential – for themselves and the region – and so work hard to adapt their services for the fastest growing alternative energy market. Currently, the greatest momentum for Ohio's leadership in this industry may lay off-shore, with about 70 GW (Gigawatts) of potential wind power estimated for the Great Lakes region. Recently, the economic impact of first a 20MW pilot project and eventually a 1 GW project in Lake Erie has been estimated at up to 8000 jobs and \$7.8 billion in wages over the next 20 years.

This proposal, entitled *Experimental Utility-scale Multi-megawatt Near-shore Wind Farm for Advanced Research and Power Generation*, is the necessary route for off-shore wind energy, and is the very first of its kind in the country. It includes the installation, operation, and maintenance of two utility-scale 1.65 MW (Megawatts) variable-speed direct-drive (gearless) multi-pole synchronous wind turbines with full power converters. These two turbines will create a total proposed capacity of 3.3 MW at the near-shore location in Cleveland. This is not only the most advanced wind power generation technology available, but it is also the least maintenance-intensive technology and the best for grid integration, making it suitable for Lake Erie or near-Lake Erie operational environments. Leading wind turbine manufacturers (GE, Enercon, Siemens, MTorres, etc) have recently identified this technology as the most appropriate for off-shore wind energy applications.

The turbines will be part of the *Wind Energy and Control Systems Center* at Case Western Reserve University. They will contribute to a research facility that will be funded, operated, and maintained by a consortium that includes public and private partners, each owning different levels of participation and interests ranging from renewable power generation, advanced research, jobs creation, education, training, etc. Case Western Reserve University, Wind Logistics LLC (an affiliate of the Great Lakes Towing Company), and MT Energy USA (an affiliate of MTorres) are developing this proposal. Various levels of collaboration and partnership with other partners have also been pursued, including public entities, private wind energy companies, other research institutions, and foundations.



CASE SCHOOL  
OF ENGINEERING

CASE WESTERN RESERVE  
UNIVERSITY

2095 Martin Luther King Jr. Drive, Nord 500  
Cleveland, Ohio 44106  
(216) 368-4436  
[www.engineering.case.edu](http://www.engineering.case.edu)

In this proposed Wright Project, the consortium will operate a world-class research and training facility (the *Wind Energy and Control Systems Center*) at two locations: the academic side, housed at CWRU, and the technical side, located on property adjacent to the Great Lakes Towing Company and Lake Erie. The facility will include a 24x7 wind turbine monitoring center, training facilities for student instruction, craned work space to provide hands-on experience with turbine repair and experimentation, and storage space for component inventory. Some of the research and commercialization goals may include smart blade research, including the testing of advanced sensors to help maximize power yield and reduce mechanical loads through improved blade performance; testing blade de-icing mechanisms; integrating large wind energy into the power grid and isolated grids; control and energy storage control; facilitating interaction between large-scale diesel backup-power generators and wind power generators; and recharging of electric vehicles/vessels, etc.

If funded, this proposal team will combine its expertise, infrastructure, and access to develop near-shore and off-shore wind energy technology in Ohio that will lead to rapid innovation of new products. Potentially applicable to the entire wind industry, the new products are of immediate value to the young off-shore industry of Lake Erie. By creating such, this project team, with Ohio Third Frontier support, will ensure the economic growth and job creation that come with this innovation remain in Ohio.

Sincerely,

Mario Garcia-Sanz  
The Milton and Tamar Maltz Professor in Energy Innovation  
Director, Wind Energy and Control Systems Center  
Case Western Reserve University

**Hansen, Andrew**

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**OTFWPP 11-416**

**From:** Bonsignore, Cyndy [bonsignore.1@osu.edu]  
**Sent:** Monday, November 29, 2010 3:55 PM  
**To:** OTFWPP2011  
**Cc:** Robert Lane; Giorgio Rizzoni; Don Butler  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** FY 2011 OHIO THIRD FRONTIER WRIGHT PROJECT PROGRAM LOI.doc; FY 2011 OHIO THIRD FRONTIER WRIGHT PROJECT PROGRAM LOI.pdf

Attached is a Letter of Intent for the above-referenced program. We include here a Word version of the document, as well as a pdf file -- just in case there are problems reading either type of document. Please let me know if you have questions or concerns regarding this Letter of Intent to the Wright Projects program.

Thanks in advance.

Cyndy Bonsignore

Cyndy L. Bonsignore, CRA  
Sr. Sponsored Program Officer  
The Ohio State University  
Engineering Research Services  
224 Bolz Hall, 2036 Neil Avenue  
Columbus, OH 43210  
Phone: 614-292-2411  
Fax: 614-247-4521  
e-mail: [bonsignore.1@osu.edu](mailto:bonsignore.1@osu.edu)

## FY 2011 OHIO THIRD FRONTIER WRIGHT PROJECT PROGRAM

**Lead Applicant:** The Ohio State University Office of Sponsored Programs, 1960 Kenny Road, Columbus, OH 43210

**Proposal Title:** Center for Advanced Energy Storage Interoperability

**Budget Request (Estimated):** \$3,000,000 (\$2,500,000 capital plus \$500,000 operating funding)

**Industry Partners:** CAR Technologies, Major Battery OEMs, Major Utility, Major Vehicle OEM, and others

**Contact:** Dr. Giorgio Rizzoni, Center for Automotive Research and Mechanical Engineering Department – 930 Kinnear Road, Columbus, OH 43212, e-mail: [rizzoni.1@osu.edu](mailto:rizzoni.1@osu.edu), tel. (614-688-3856), fax. (614) 688-4111.

**Principal Investigator:** Dr. Yann Guezennec, email: [guezenec.1@osu.edu](mailto:guezenec.1@osu.edu).

The grand challenge facing the transportation and energy industries is the development of efficient and affordable technologies for next-generation energy storage systems. In addition to the advanced energy storage systems for hybrid and electric vehicles under development, new energy systems, such as photovoltaic and wind power generation systems also need the development of low-cost and long-life energy storage systems to enable these new energy systems to be connected to electric power grids and to encourage their dissemination. And while it is anticipated that the use of IT will help reduce the burden on the environment, IT-related equipment – including the explosive growth in broadband network and distributed computing resources - itself is expected to consume enormous quantities of power in the future. Distributed energy storage strategies for IT-related equipment is also now considered an important priority.

The need for distributed power topologies including distributed energy storage interconnection technologies with advanced functionality that include the integration and standardization of critical energy storage components; standardization of controls and operations; and new modeling tools for energy storage systems for energy systems planning and analysis, will enable a high penetration of distributed energy storage networks for automotive, utility, commercial, industrial, and military applications.

To drive the market for interoperability solutions for energy storage applications, The Ohio State University, as the lead applicant, is proposing the development of a Center for Advanced Energy Storage interoperability that focuses on:

- I. Development of elemental technologies
  - a. Studies on topics such as system configuration and optimization methods, optimal heat management methods, vocation-specific modeling and designs, and inter-vocation battery/storage component reuse will be carried out, and a comprehensive evaluation of existing storage networks will be conducted.
  - b. Technological development of advanced, lower cost components, connectors and controls that enable “plug & play” energy storage architectures will be advanced.
  - c. Control systems for modular management will be developed, and performance, prototyping, and demonstration activities at sub-system level will be verified.
- II. Development of technologies for practical application
  - a. A 480-960 V-class heterogeneous energy storage system for testing, education, and research will be developed and demonstrated.
  - b. Effective evaluation methods for the critical dimensions of energy storage systems, including performance, cost, safety, and service life, will be investigated to clarify the implementation and certification requirements for energy storage systems interoperability and reuse.
  - c. Tools for high-fidelity design, analysis, and optimization of distributed energy storage networks – using co-simulation technologies to improve solution development, advance integration services, and accelerate deployment of new energy storage systems – will be developed.
- III. Development of next-generation energy storage education
  - a. Hands-on student teams will be given opportunities to design and develop advanced energy storage systems for target industry vocations using the principles of interoperability developed above.
  - b. Additional applied research and testing will be enabled for novel materials, components, structures, and network design and management processes, etc., in order to establish low-cost, long service life energy storage networks.

**Hansen, Andrew**

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**OTFWPP 11-417**

**From:** Bonsignore, Cyndy [bonsignore.1@osu.edu]  
**Sent:** Monday, November 29, 2010 3:57 PM  
**To:** OTFWPP2011  
**Cc:** Giorgio Rizzoni; Don Butler; Robert Lane  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** FY 2011 OHIO THIRD FRONTIER WRIGHT PROJECT PROGRAM LOI\_Lightweighting.doc;  
FY 2011 OHIO THIRD FRONTIER WRIGHT PROJECT PROGRAM LOI\_Lightweighting.pdf

Attached is a second Letter of Intent for the above-referenced program. We include here a Word version of the document, as well as a pdf file -- just in case there are problems reading either type of document. Please let me know if you have questions or concerns regarding this Letter of Intent to the Wright Projects program.

Thanks in advance.

Cyndy Bonsignore

Cyndy L. Bonsignore, CRA  
Sr. Sponsored Program Officer  
The Ohio State University  
Engineering Research Services  
224 Bolz Hall, 2036 Neil Avenue  
Columbus, OH 43210  
Phone: 614-292-2411  
Fax: 614-247-4521  
e-mail: [bonsignore.1@osu.edu](mailto:bonsignore.1@osu.edu)

## FY 2011 OHIO THIRD FRONTIER WRIGHT PROJECT PROGRAM

**Lead Applicant:** The Ohio State University Office of Sponsored Programs, 1960 Kenny Road, Columbus, OH 43210

**Proposal Title:** Center for Advanced Lightweight Applications for Transportation Energy Efficiency

**Budget Request (Estimated):** \$3,000,000 (\$2,500,000 capital plus \$500,000 operating funding)

**Industry Partners:** Cascade Engineering, Productive Research, Major Steel OEM, Major Vehicle OEMs, others

**Contact:** Dr. Giorgio Rizzoni, Center for Automotive Research and Mechanical Engineering Department – 930 Kinnear Road, Columbus, OH 43212, e-mail: [rizzoni.1@osu.edu](mailto:rizzoni.1@osu.edu), tel. (614-688-3856), fax. (614) 688-4111.

The Center for Advanced Lightweight Application for Transportation Energy Efficiency will be focused on developing the market for new, cost-effective, energy efficient applications and process technologies to enable the U.S. transportation industry to be more energy efficiency through vehicle weight reduction. Lightweight materials have been identified as necessary for the Department of Energy programs in electric and hybrid vehicles, assisting those technologies by allowing the use of smaller, and therefore lower cost, battery and drive systems, as well as providing broader options in the design of the overall vehicle "packaging." Electric vehicles - plug-in hybrids and battery powered - will comprise nearly 20% of the global market for light vehicles in 2030, according to a study by automotive industry analysts at IHS Global Insight.

Consumer preferences have limited the downsizing options available to automakers, and safety and performance standards have resulted in a very limited ability to reduce weight further with conventional materials. With 75% of vehicle energy consumption directly related to factors associated with vehicle weight, the potential benefits of weight reduction enable smaller powertrain components (engine, electric motor, APU, etc.) and energy storage (battery) systems, with corresponding cost and/or performance benefits. In all cases, the price/performance of lightweight applications is a significant consideration, as well as other energy, safety, and health issues associated with new materials and process technologies.

Advanced applications for lightweighting have been identified as critical to reducing fuel consumption in "conventionally powered" automobiles and light and heavy duty trucks as well. Legislative actions, 1) Clean Air Act Amendments, 2) California Air Quality Standards (also adopted by several other states), 3) the National Energy Policy Act, and higher corporate average fuel economy (CAFE) standards for passenger and commercial vehicle fleets, have resulted in increased emphasis on electric, hybrid, and alternatively fueled vehicles, as well as significant emphasis on improved fuel economy of conventional vehicles. In addition the military is looking for state-of-the-art lightweight armored vehicles, ranging from light tactical vehicles to passenger vehicles. Advanced engineering (forming and joining) techniques, coupled with sophisticated, lightweight materials are required to produce lightweight armored vehicles.

Ohio has significant steel, polymer and auto/commercial/military supply chain capabilities. Thermoplastics, in particular, are a rising star of automotive composites - growing in use at about 30% a year. For applications requiring high mechanical strength and dimensional stability over time, (long) fiber reinforced thermo-plastics (LFTs) are leading the trend towards metal replacement in non-structural modular components. The average weight of a passenger vehicle has actually increased 400lbs over the past decade and vehicle OEMs have targeted to eliminate that weight by their 2013-2014 model years. Demand is strong, but more innovation is required.

The Center will serve as a primary focal point for collaboration, innovation, and interaction with newly available polymer composites, advanced steels, high performance steel-polymer laminates, aluminum alloys, and magnesium alloys for auto and truck manufacturers and suppliers in the transportation industry. The primary focus will be the development of lightweight, fuel-efficient cars and trucks, by 1) accelerating the identification and development of new applications for these important materials, and 2) the development and characterization of new methods for forming, joining, managing corrosion, and manufacturing of dissimilar materials, and 3) manufacturing processes for light composites/laminates/alloys, joining for lightweight vehicles, recycling and lifecycle issues and crashworthiness design for lightweight vehicles. Working closely with our customers, we will identify/tailor, custom design and test solutions that deliver specific high-impact commercial applications.

**From:** Michael D. Sumption [sumption@matsceng.ohio-state.edu]  
**Sent:** Monday, November 29, 2010 4:54 PM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** LOI-Wright-Project-10-OSU-MSE-I.doc

**Below is a letter of intent for the 2011 Wright Projects**

It is given both as text, and by attachment. Please send a notification of receipt.

Thank you. Mike Sumption

**Letter of Intent for a proposal to the Third Frontier Wright Projects Program**

Nov 29, 2010

**Lead Applicant:** The Ohio State University

**Address:** 1960 Kenny Rd.

**Phone No.** 614-688-3684

**Contact Person:** Mike Sumption

**e-mail:** [sumption.3@osu.edu](mailto:sumption.3@osu.edu)

**Estimated Funds Requested:** \$1,700,000

**Known Collaborators:** Hyper Tech, Global R&D, Eden Cryogenics, M2M Imaging

**Project Title:** Cryogenic Engineering and Device Laboratory for Medical and Energy Applications

**Summary of the Proposed Project:**

This proposal is dedicated to the development of a Cryogenic Engineering and Device Laboratory to support a strong cluster of Ohio anchor industries focused in cryogenic-enabled devices. Cryogenic materials, cryogenic engineering, and cryogenic devices are important enabling technologies for certain key classes of devices and applications. The relevant industries include those working in medical as well as emerging energy applications. The Cryogenic Engineering and Device Laboratory will be focused around equipment aimed at (i) increasing the efficiency and cost efficiency of cryogenic devices for energy applications, and (2) developing more application-relevant forms of existing materials for medical applications. Presently, in a number of areas the cryogenic capabilities and devices are not optimized, and in some cases not sufficiently developed, to allow for the potential commercial applications. The key facilities needed are enhanced cryogenic design and test bed capabilities, expanded computational design and analysis capabilities, and device (thin film) prototype facilities. Potential applications targeted include magnet systems for medical and power applications, and thin film device based RF coils for MRI systems.

Mike Sumption

Adj. Professor and Assistant Director

CSMM (Center for Superconducting and Magnetic Materials), MSE

SuTC (Superconducting Technology Center)

477 Watts Hall, 2041 College Rd

The Ohio State University

Columbus, OH 43210

Phone: 614-688-3684

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e-mail: [mdsumption+@osu.edu](mailto:mdsumption+@osu.edu)

<http://www.matsceng.ohio-state.edu/csmm/>

<http://www.matsceng.ohio-state.edu/faculty/sumption/>

## **Letter of Intent for a proposal to the Third Frontier Wright Projects Program**

Nov 29, 2010

**Lead Applicant:** The Ohio State University

**Address:** 1960 Kenny Rd.

**Phone No.** 614-688-3684

**Contact Person:** Mike Sumption

**e-mail:** sumption.3@osu.edu

**Estimated Funds Requested:** \$1,700,000

**Known Collaborators:** Hyper Tech, Global R&D, Eden Cryogenics, M2M Imaging

**Project Title: Cryogenic Engineering and Device Laboratory for Medical and Energy Applications**

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**Hansen, Andrew**

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**OTFWPP 11-419**

**From:** Schall, Constance Ann [constance.schall@utoledo.edu]  
**Sent:** Monday, November 29, 2010 6:02 PM  
**To:** OTFWPP2011  
**Cc:** Coleman, Maria R.  
**Subject:** ?2011 OTFWPP LOI?  
**Attachments:** OTFWPP2011\_LOI\_Schall.pdf

Attached, please find our letter of intent for the Wright Capital Project 2011 competition.

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Constance Schall, PhD, PE  
Professor, Graduate Director  
University of Toledo  
Dept. of Chemical & Environmental Eng.  
Mail Stop 305  
2801 W. Bancroft St.  
Toledo, OH 43606  
ph:419-530-8097 Fax:419-530-8086

Project Title: Center of Excellence for Bio-refining: Bio-Derived Fuels, Polymers and Advanced Materials.

Lead Applicant: The University of Toledo  
Office of Research  
University Hall; Room # 2300  
2801 West Bancroft St.  
Toledo, OH 43606

Contact Person: Constance Schall  
Professor of Chemical Engineering  
The University of Toledo  
Email: [constance.schall@utoledo.edu](mailto:constance.schall@utoledo.edu)  
Phone: (419) 530-8097

Known

Collaborators: (1) Poly One  
Mr. Roger Avakian, Vice President Scientific Development  
33587 Walker Road  
Avon Lake, OH 44012

(2) Center for Innovative Food Technologies (CIFT)  
Mr. David Beck, Director  
AirPort Hwy.; Toledo, OH 43617

(3) SuGanit Systems Inc.; Mr. Praveen Paripati, President  
Research Incubation Center; Suite #201; 2400 Dorr Street  
Toledo, OH 43606

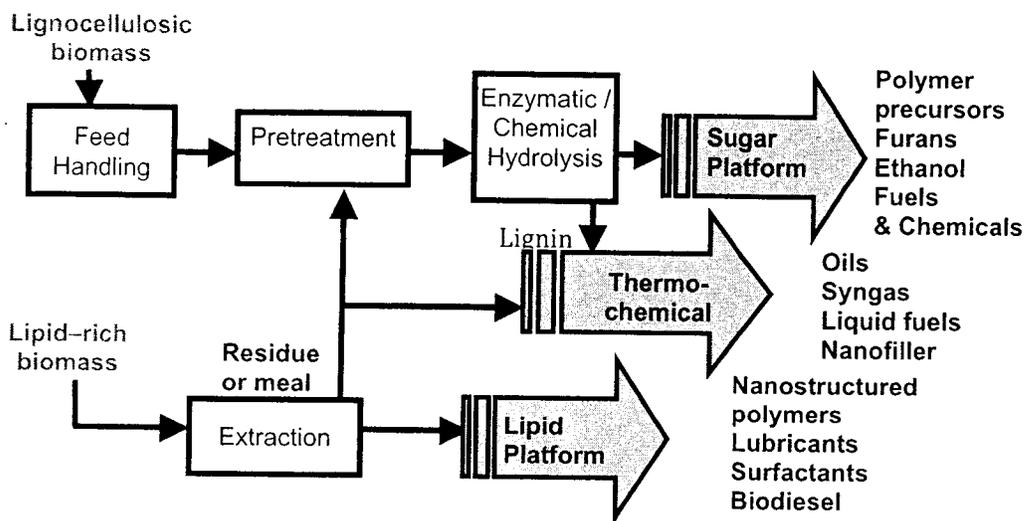
Estimated Grant Funds to be requested: \$3 million from ODOD with another \$3 million cost share from the lead applicant and the collaborators.

A brief summary of the proposed work is provided on the next page.

Biomass, derived from algae and non-food agricultural crops and waste streams, can serve as a clean renewable carbon source for fuels, polymers and advanced materials in much the same way that crude oil serves as the carbon source in petrochemical refineries. Development of alternative co-products and advanced materials, such as polymers, elastomers, nanomaterials (and complex fluids), pharmaceuticals and value added chemicals, from a variety of biomass feedstocks is important in supporting the sustainability and economic stability of bio-fuels facilities. Despite wide interest in these renewable carbon sources, commercialization of bio-derived products and fuels is still in its infancy. The state of Ohio, with its strong positions in manufacturing and agriculture, can lead efforts to overcome obstacles in commercialization of integrated bio-refineries with investment in an academic – industry consortium to facilitate synergies among industry and academic partners, reducing repetition of research and directing efforts for overcoming common challenges. The proposed consortium will build on strengths in research expertise at the University of Toledo in biomass conversion to polymers, fuels and chemical precursors, catalysis and polymer development. The University of Toledo Polymer Institute has an existing industry consortium focusing on packaging materials which provides a key group of industrial partners for extending our academic – industry consortium. *The incorporation of bio-derived materials into the product streams of our industry collaborators will be essential in meeting goals for reduced carbon footprint and incorporation of green chemistries.*

The immediate aim of this proposal is to provide a forum for exchange of approaches to solutions to technical challenges in commercialization of bio-derived polymers and materials between industrial and academic participants. A second important goal of this proposal is to establish a research and product development platform at the University of Toledo focused on testing and development of polymer precursors and blends, catalytic conversion of bio-renewables, and incorporation of bio-derived chemicals into value-added products. Industrial collaborators will have access to the equipment obtained through this grant, input on the direction of academic research, and access to research results and graduates trained in key areas of industrial interest.

The infrastructure supported by this proposed project will support both near-term and long-term commercialization and product development of bio-based feedstocks to value-added products through *sugar and lipid platforms* as shown in Figure 1. These platforms represent the front-end processing of lignocellulosic (agricultural and forestry waste) and lipid-rich (algae and oil seeds) biomass feedstocks to produce sugars and lipids that, in turn, form the precursors for the production of a value-added materials, chemicals, and fuels. Processing residues, can also be used for product and energy development.



**Figure 1.** Pathways associated with the sugar and lipid platforms for biomass utilization to produce value-added products.

**From:** Roger French [rxfl31@case.edu]  
**Sent:** Tuesday, November 30, 2010 6:24 AM  
**To:** OTFWPP2011  
**Cc:** Michael Crifasi; Jared Schnall  
**Subject:** 2011 OTFWPP LOI\_CWRU\_Solar-Durability and Lifetime Extension (S-DLE) Center  
**Attachments:** FrenchSolar-DLE-OTFWPP2011-LOI-submitted.pdf

Dear Ohio Department of Development and Ohio Third Frontier,

Please accept our Letter of Intent for the 2011 Wright Projects Program, entitled "Solar-Durability and Lifetime Extension (S-DLE) Center." Case Western Reserve University will be the lead applicant. Thank you, and we look forward to submitting a full proposal.

Sincerely,

Roger H. French  
F. Alex Nason Professor  
Department of Materials Science & Engineering  
302 White Hall, 2111 Martin Luther King Jr. Drive  
Case Western Reserve University  
Cleveland OH 44106-7204

email: [roger.french@case.edu](mailto:roger.french@case.edu)  
web: <http://dmseg5.cwru.edu/People/faculty.php?id=rxfl31>  
office phone: 216 368 3655  
cellphone: 302 468 6667  
home phone: 216 744 2015  
skype: rogerhfrench



GREAT LAKES  
ENERGY  
INSTITUTE

2101 Martin Luther King Jr. Drive, Olin 305  
Cleveland, Ohio 44106-7074  
(216) 368-0748  
energy.case.edu

November 30, 2010

Dear Ohio Department of Development,

Please accept this Letter of Intent (LOI) from Case Western Reserve University (CWRU) for our 2011 Wright Projects Program proposal.

**Lead Applicant's Name:** Case Western Reserve University (CWRU)  
**Address:** Great Lakes Energy Institute (GLEI) at CWRU  
2101 Martin Luther King Jr. Drive, Olin 305  
Cleveland, Ohio 44106  
**Telephone:** (216) 368-0748  
**Contact Person:** Dr. Roger French  
**Contact Email:** roger.french@case.edu

**Proposed Project Title:** Solar-Durability and Lifetime Extension (S-DLE) Center

**Estimated Grant Funds to be Requested:** \$3 Million (\$2.5M WCF / \$500K R&DF)

**Known Collaborators:** DuPont Photovoltaic Solutions, Tremco, Q-Lab, eQED

#### Project Summary

Multiple commercial energy products, including photovoltaics (PV), must at some point in product development consider service lifetime prediction (SLP). SLP provides investors and early customers with the timeframe for which a technology should reliably perform. In solar energy, failure to match actual performance (at times <5yrs) with warranties and promise (>20yrs) has dogged young companies. Many have exited business while their initial modules remain in service. External coatings and new roofing material have faced similar fates. This phenomenon illustrates a largely unaddressed commercial barrier, one heavily prevalent in advanced energy and energy efficient products: how to develop technologies that not only achieve market entry, but once there, remain viable in the face of harsh solar and environmental exposure.

Case Western Reserve University (CWRU) and its partners seek to address this challenge by creating the Solar-Durability and Lifetime Extension (S-DLE) Center. The S-DLE Center will insert reliable, accelerated lifetime testing and mechanistic modeling into the early stages of product development. This improvement will allow industries to produce superior products by selecting better materials, components, and systems up front based on lifetime and degradation science. Such provides a more appropriate approach than is currently in practice, as today, manufacturers, lacking the R&D capabilities to do otherwise, use existing qualification tests – designed for initial performance and safety – to develop their SLP. In order to provide the missing R&D opportunities required for change, the S-DLE Center will transform multiple disjointed and partially-equipped CWRU facilities into one state-of-the-art, contiguous, larger scale hub. This recognizable space, housed within CWRU's White Building, will connect the talents of the multiple disciplines, beginning with renowned abilities in Materials Science and Engineering. This interdisciplinary pairing will provide the proper, integrated study needed to explore the fundamentals of lifetime and degradation. A physical facility unparalleled in the nation, which combines both indoor and outdoor test beds, the Center will offer Ohio companies a proximate location to achieve commercial advantage. In addition, the Center will teach a new generation of scientists and engineers the correct theory and ability needed to develop energy efficient products that perform long beyond the 20 year lifetimes expected today.

Over its initial project period, this Wright Project will specifically focus on developing the processes and testing for solar radiation and environmental exposures, and the evaluation and metrology of materials, components, and PV modules and other products before and after these exposures. These post-exposure optical and thermo-mechanical evaluations will be focused on lifetime and degradation rates for individual degradation mechanisms, which can be bulk or interfacial in

Great Lakes Energy Institute @ CWRU



GREAT LAKES  
ENERGY  
INSTITUTE

2101 Martin Luther King Jr. Drive, Olin 305  
Cleveland, Ohio 44106-7074  
(216) 368-0748  
energy.case.edu

nature. For interfacial degradation processes, such as corrosion, adhesive failure, and fracture, much of the groundwork has already been established in Case Western Reserve's Swagelok Center for Surface Analysis of Materials (SCSAM) under prior Wright Project funding. This funding request will focus on establishing the solar and environmental exposure conditions needed for realistic and accelerated exposure of PV and other product materials, components, and systems, as well as on the necessary optical and electrical evaluations needed to track degradation rates and identify mechanisms. Thus, creation of the S-DLE Center will allow CWRU to offer a more comprehensive spectrum of product improvement to commercial entities.

Initial partners in this Wright Project will be Ohio companies who have active product development activities in the later stages of the Ohio Third Frontier's Commercialization Framework, where they are naturally working to address their product's lifetime, reliability, and degradation requirements. CWRU will utilize the S-DLE Center to work with these and other partners on multiple lifetime projects, enabling them to access the solar and environmental exposures required with the necessary optical, electrical, and structural evaluations. As the time of this Letter of Intent, these partners include DuPont, Tremco, Q-Lab, and eQED. We also have ongoing discussions with other companies. Each of these partners brings to the S-DLE Center a specific, late-stage commercial product development effort in need of improved solar durability and SLP. To demonstrate their commitment, all partner companies will provide significant share within the initial burden needed to develop the S-DLE Center.

If successful, this Wright Project will leverage the already large investment Ohio has made in PV, advanced energy, and materials research and commercial growth. From this success, expedient competitive innovation will arise, complementing the efforts of several other states while retaining Ohio's distinctiveness in multiple advanced energy production and efficiency markets. The result will be new commercial products and services addressing the goals of both the Third Frontier and the State of Ohio: creating green jobs and industry that allow Ohioans to lead the transition to alternative energy and long-term economic vitality.

Sincerely,

A handwritten signature in cursive script that reads "Roger H. French".

Roger French

F. Alex Nason Professor, Materials Science and Engineering

**Hansen, Andrew**

---

**OTFWPP 11-421**

**From:** Kristina Kennedy [kennedy.443@osu.edu]  
**Sent:** Tuesday, November 30, 2010 8:55 AM  
**To:** OTFWPP2011  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** 2011 OTFWPP LOI.docx

Please see the attached document for our Wright Projects Letter of Intent for the *Light Vehicle Manufacturing Commercialization Center*.

Sincerely,

Dr. Glenn Daehn  
Director, Ohio Manufacturing Institute

Kristina Kennedy  
Manager, Ohio Manufacturing Institute

1248 Arthur E. Adams Drive  
Columbus, OH 43221  
Phone: (614) 688-4116  
Web: [omi.osu.edu](http://omi.osu.edu)



Manufacturing  
Institute

Ohio Manufacturing Institute  
1248 Arthur E. Adams Drive  
Columbus, OH 43221  
phone: 614-292-6779  
daehn.1@osu.edu

---

30 November 2010

The Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25th Floor  
Columbus, OH 43215

Re: Letter of Intent for the Ohio Third Frontier Wright Projects Program

Dear 2011 OTFWPP Staff,

The Ohio Manufacturing Institute intends to submit a Wright Projects Proposal to establish a Light Vehicle Manufacturing Commercialization Center for the design and manufacturing of Lightweight Vehicle Structures.

**Lead Applicant:** Ohio Manufacturing Institute  
1248 Arthur E. Adams Drive  
Columbus, Ohio 43221

**Contact Person:** Dr. Glenn Daehn  
[Daehn.1@osu.edu](mailto:Daehn.1@osu.edu)  
614-292-6779

**Project Title:** Light Vehicle Manufacturing Commercialization Center

**Grant Funds:** \$3,000,000

**Collaborators:** Cutting Dynamics (Avon, OH)  
American Trim (Lima OH)  
OSU's Center for Automotive Research  
Sutphen Fire Trucks (Hilliard, OH)  
EWI  
Ohio Supercomputer Center  
Automotive OEM (to be named)  
Possibly others

**Focus Area:** Advanced Materials

**Project Summary:**

This project will leverage a recently won Department of Energy \$25M US-China Clean Vehicle Collaboration that was awarded to OSU and partners. This activity includes a thrust on light vehicle structures that includes the development of reinforced thermoplastic beams and multi-material joining methods to incorporate these in vehicle structures, but is not aggressive enough to fully commercialize these technologies.

A new consortium jointly supported by the Ohio Manufacturing Institute and the Center for Automotive Research will be established to commercialize new manufacturing technologies for a

range of light vehicle structures scaling from low-volume to high-volume production. The commercialization of light polymer composite beams and conformal interference joining will provide new product lines for Cutting Dynamics and American Trim in the near term (less than 3 years). Over the longer term this center will provide product development, research and training in next-generation light multi-material vehicle structures in a way that compliments the advanced powertrain work that is a signature of the Center for Automotive Research and a proven engine for economic growth.

It is anticipated that the request will be for an amount of \$2.5M in capital equipment and \$500k in operating expenses and will be matched 1:1.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Glenn Daehn". The signature is fluid and cursive, with a long horizontal stroke at the end.

Glenn S. Daehn, Ph.D.  
Director, Ohio Manufacturing Institute and  
Mars G. Fontana Professor of Metallurgical Engineering  
Department of Materials Science and Engineering, The Ohio State University

**From:** Steve Fening [SFening@abiakron.org]  
**Sent:** Tuesday, November 30, 2010 9:10 AM  
**To:** OTFWPP2011  
**Cc:** Day, Roger; David Kay; seth@orl-inc.com; jon@orl-inc.com; Matthew L. Becker Ph. D. (becker@uakron.edu); robhbell@aol.com; Brian Davis; Thom Olmstead; Shauna Brummet; Aram Nerpouni; Frank Douglas  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** 2011 OTFWPP LOI Austen BioInnovation Institute in Akron.pdf

Please accept this letter to confirm our intent to submit a proposal to the 2011 Ohio Third Frontier Wright Projects Program.

Please confirm receipt of this document.

Sincerely Yours,  
Steve Fening

---

**Stephen D. Fening, Ph.D.**  
Director, Orthopaedic Devices  
Medical Device Development Center  
Austen BioInnovation Institute in Akron  
Office: (330) 572-1684 | Main: (330) 572-7544  
Email: [sfening@abiakron.org](mailto:sfening@abiakron.org)

**A U S T E N**  
**BiInnovation**  
**I N S T I T U T E I N A K R O N**

**Stephen D. Fening, Ph.D.**

Director, Orthopaedic Devices  
Medical Device Development Center

November 30, 2010

Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, OH 43215  
OTFWPP2011@development.ohio.gov

**Subject: 2011 OTFWPP LOI**

Dear Sir or Madam:

Please accept this Letter of Intent from Austen BiInnovation Institute in Akron for our Ohio Third Frontier Wright Projects Program (OTFWPP) proposal. The relevant information about our proposal is as follows:

**Lead Applicant Name:** Austen BiInnovation Institute of Akron  
1 South Main Street, Suite 401  
Akron, OH 44308

**Contact Person:** Stephen D. Fening, Ph.D.  
Director, Orthopaedic Devices  
(330) 572-1684  
sfening@abiakron.org

**Proposed Project Title:** Center for Advanced Materials and Devices for Orthopaedic Applications

**Estimated Funds Requested:** \$3,000,000

**Known Collaborators:** The Lubrizol Corporation  
OrthoHelix  
Orthopaedic Research Laboratories  
The University of Akron  
Summa Health System

**Summary of Proposed Project:**

Musculoskeletal disease is a leading cause of disability in Ohio and across United States. It accounts for over 50% of all chronic conditions for people over 50 years of age. The economic impact is staggering, with an estimated cost of \$849 billion in the U.S. (7.7% of gross domestic product) for treatment and lost wages. The human toll in terms of diminished quality of life is immeasurable. Still, the investment in musculoskeletal innovation lags behind other chronic conditions.

The purpose of the proposed Center for Advanced Materials and Devices for Orthopaedic Applications is to improve the treatment of musculoskeletal disease through the development of advanced biomaterials and medical devices. This center will focus on (i) the design of advanced biomaterials and medical devices, (ii) reducing designs to practice in a new state-of-the-art device prototyping facility, and (iii) continuous ideation sessions involving industry leaders in Ohio in collaboration with world-class orthopaedic surgeons.

Sincerely,



Stephen D. Fening, Ph.D.

**Hansen, Andrew**

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**OTFWPP 11-423**

**From:** Sozer, Yilmaz [ys@uakron.edu]  
**Sent:** Tuesday, November 30, 2010 9:17 AM  
**To:** OTFWPP2011  
**Cc:** De Abreu-Garcia, Jose Alexis; Mahajan, Ajay; ntsmith@recharge-power.com; mdaroux@stratumenergy.com; Dana.Myers@myersmotors.com  
**Subject:** LOI to Submit OTFWPPFY11 Proposal to ODOD  
**Attachments:** UA LOI OTFWPP2011 30 Nov 2010.pdf

Dear Sir/Madam

Attached please find the letter of intent in response to Ohio Third Frontier Wright Projects Program Fiscal Year 2011 Request for Proposals.

Sincerely,

Yilmaz Sozer.

-----  
Yilmaz Sozer, Ph.D.

Assistant Professor

Department of Electrical and Computer Engineering

The University of Akron

302 East Buchtel Avenue

Akron, OH 44325-3904

Phone: (330) 972-7629

email: [ys@uakron.edu](mailto:ys@uakron.edu)



Office of the Dean  
College of Engineering  
Akron, OH 44325-3901  
(330) 972-7816 Office – (330) 972-5162 Fax  
(330) 972-2413 Fax

30 November 2010

Ohio Third Frontier Wright Projects Program Fiscal Year 2011 (OTFWPPFY11)  
The Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, Ohio 43215

RE: Letter of Intent to Submit an OTFWPPFY11 Proposal to ODOD

Dear Sir/Madam:

The University of Akron hereby submits a Letter of Intent in response to the Fiscal Year 2011 Ohio Third Frontier Wright Projects Program Request for Proposals.

Prospective Lead Applicant's Name: The University of Akron

Prospective Lead Applicant's Address: College of Engineering  
The University of Akron  
Akron, OH 44325-3901

Contact Person: Yilmaz Sozer

Contact Person Phone Number: (330) 972-7629

Contact Person E-Mail: [ys@uakron.edu](mailto:ys@uakron.edu)

Proposed Project Title: *Development of Clean Energy Vehicle to Grid Systems*

Estimated Funds Requested: \$3,000,000

Known Collaborators: Recharge Power, Myers Motors, Stratum Energy Systems, and others to be determined.

Sincerely,

Ajay Mahajan, Ph.D.  
Associate Dean for Research  
College of Engineering  
The University of Akron

xc: Luis Proenza, President, The University of Akron

Proposed Project Summary: *Development of Clean Energy Vehicle to Grid Systems*

This grant application seeks funding for the development of fast, high power (Level -3) charging stations as well as vehicle-to-grid (V2G) capable Level-1 and Level-2 charging units for plug-in hybrid vehicles. The University of Akron (UA) research team will work with Gates Mills-based Recharge Power, Tallmadge-based Myers Motors, and Cleveland-based Stratum Energy Systems to fully develop their products and bring them to market.

Recharge Power has been commercializing Level-2 charging stations around the state for the past two years. The company's existing charging stations are designed to charge the plug in electric vehicles in 6-8 hours minimum. The UA's expertise in high power static power conversion and innovative dc-dc converter design would enable Recharge Power to commercialize fast Level-3 charging stations. These efficient, fast and cost competitive charging stations will serve best to America's electrification infrastructure. V2G capability will also be an integral part of the Level-3 chargers to communicate with the smart grid and provide bidirectional power flow. Adding V2G to the Level-3 charging station will not only be an asset but it will also function as an energy reservoir for the grid.

The UA team will work with Myers Motors to develop the power electronics interface (PEI) between the vehicle and the utility grid for V2G capability where the vehicles can work as distributed resources and power can be sent back to the utility. The hardware unit will incorporate the communication interface between vehicles and the smart-grid, and will be commercialized as an integral part of the vehicle's energy storage system. We expect that these activities will lead to the high-volume production in Ohio of electric vehicles, and V2G control systems that can compete in global markets on the basis of price, features, and advanced technology.

Most of the renewable energy sources are interfaced to the utility grid, which provides a buffer for the fluctuations in the source and the load side. As such power flow from the renewable energy sources into the electric vehicles are done through the grid interface. In the absence of the utility grid energy extraction from the renewable sources and electric charging to the electric vehicles would not be possible. Microgrid research at the UA is addressing this key challenge and will provide solution to the partnering Clean Energy companies. The UA will work with Recharge Power and Stratum Energy Systems to develop Microgrid charging stations that can work in grid independent mode.

Recharge Power, based in Northeast Ohio, provides innovative solutions for commercial parking and transportation customers. The company's product line includes networked, dual-vehicle 240V charging stations for electric vehicles, and wireless signage systems for driver way-finding. The Recharge Stations are supported by an Internet hosted back end database that tracks all transactions and records key statics including charging periods, kilowatt consumption, revenues, costs, and payment method. The flexible Recharge Stations offer a variety of payment options (credit card, subscription, pay-by-phone) and communication technologies including cellular modem, WIFI, and Ethernet cable. The Company manufactures its Recharge Stations in Northeast Ohio and is currently shipping and installing units at customer sites.

Myers Motors has established itself as a leading manufacturer of electric vehicles. Myers Motors is dedicated to providing creative, innovative, functional, and responsible alternative forms of transportation with a zero carbon footprint. The company specializes in one- and two-seat electric vehicles that sport unique styling, do not rust, is light weight, and can be charged overnight from a standard 110-volt home outlet without requiring any special charging system.

Stratum Energy Systems is the first Ohio-based company to industrialize the manufacture of polymer lithium-ion batteries constructed in a stacked cell format. The company's U.S. production facilities use automated, state-of-the art manufacturing processes to produce precise, high-performance, high-quality batteries that meet their individual customers' requirements. Stratum's lithium-ion batteries will not only be priced substantially below competitor's prices, but will also eliminate most shipping and associated costs, as most of these batteries are currently being imported into the U.S.

**Hansen, Andrew**

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**OTFWPP 11-424**

**From:** Shaurya Prakash [prakash.31@osu.edu]  
**Sent:** Tuesday, November 30, 2010 9:31 AM  
**To:** OTFWPP2011  
**Cc:** conlisk.1@osu.edu; 'Prof. Bharat Bhushan'  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** OSU\_Prakash\_ThirdFrontier\_LoI.pdf

Dear Sir or Madam:

Please note the attached Letter of Intent from The Ohio State University toward the submission of a proposal for the Advanced/Alternate Energy Program in response to the RFP for 2011 OTFWPP. We look forward to receiving a confirmation with an identification number for the intended proposal.

Sincerely,  
Shaurya Prakash

Shaurya Prakash  
Assistant Professor  
Department of Mechanical Engineering  
The Ohio State University  
201 W. 19th Avenue  
E347 Scott Laboratory  
Columbus, OH 43210  
Phone: (614)688-4045  
URL: <http://www.mecheng.osu.edu/lab/mins>



**Department of Mechanical  
and Aerospace Engineering**

Peter L. and Clara M. Scott Laboratory  
201 West 19th Avenue Suite N350  
Columbus, OH 43210-1142  
Phone (614) 292-2289  
Fax (614) 292-3163

The Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25th Floor  
Columbus, OH 43215

November 30, 2010

Dear Sir or Madam:

This letter is to inform you that we intend to submit a proposal with information listed as below in response to OTFWPP 2011 request for proposals released October 20, 2010.

Prospective Lead Applicant: The Ohio State University

Prospective Lead Address: Department of Mechanical and Aerospace Engineering  
Scott Laboratory  
Room E347  
201 W. 19<sup>th</sup> Avenue  
Columbus, OH 43210

Prospective Lead Applicant Contact: Dr. Shaurya Prakash

E-mail: [prakash.31@osu.edu](mailto:prakash.31@osu.edu)

Phone: (614) 688-4045

Proposed Project Title: Advanced nanofluidic platforms for high efficiency power generation systems

Known Collaborators: In discussion with several industrial partners, awaiting formal contract negotiations

Estimated funds requested: \$1,000,000

Project Summary:

We expect to submit a proposal for the Advanced/Alternate Energy program as detailed in the OTFWPP 2011 request for proposals. Specifically, our proposal will target direct generation of electricity from high pressure waste streams emanating from various sources such as power plants and water (and wastewater) treatment facilities in Ohio. Our system brings together a novel nanofluidic platform developed at The Ohio State University by the PI Shaurya Prakash in collaboration with Co-PIs, Prof. Bharat Bhushan, and Prof. A. Terrence Conlisk. In addition, we will be partnering with an industrial partner to commercialize this technology within the time frame specified in the RFP. Currently, we are in negotiations with a few potential industrial partners and are working towards finalizing formal contracts before final proposal submissions.

Sincerely,

Shaurya Prakash.

**Hansen, Andrew**

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**OTFWPP 11-425**

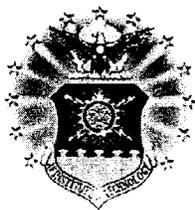
**From:** Thompson, Taylor S CTR USAF AETC AFIT/ENR [Taylor.Thompson.ctr@afit.edu]  
**Sent:** Tuesday, November 30, 2010 9:38 AM  
**To:** OTFWPP2011  
**Cc:** Polanka, Marc D Civ USAF AETC AFIT/ENY; Caylor, Michael J Civ USAF AETC AFIT/ENRS  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** OTFWPP LOI\_AFIT\_Polanka.pdf

Good morning,

Attached is the official submission of the Air Force Institute of Technology's (AFIT's) Letters of Intent (LOI) to file a FY2011 Ohio Third Frontier Wright Projects Program (OTFWPP) Proposal. If you have any questions regarding the technical aspects of this letter, please contact the faculty involved, Dr Marc Polanka, at (937) 255-3636 ext. 4714, or via email at [Marc.Polanka@afit.edu](mailto:Marc.Polanka@afit.edu). Questions regarding administrative matters should be addressed to our office at (937) 255-3633, or [proposals@afit.edu](mailto:proposals@afit.edu). Thank you for your assistance.

Very respectfully,

**Ms. Taylor Thompson, Ctr.**  
Research Grants Administrator  
Air Force Institute of Technology  
Office of Research and Sponsored Programs  
Phone: 937-255-3636 x4600  
[taylor.thompson.ctr@afit.edu](mailto:taylor.thompson.ctr@afit.edu)  
Building 641, Room 101 O  
Office of Sponsored Programs & Research Intranet website:  
<http://org.eis.afit.edu/dept/enr/default.aspx>



**Ohio Department of Development, Technology and Innovation Division  
Attention: Ohio Third Frontier Advanced Energy Program  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, Ohio 43215**

**Re: Letter of Intent for the 2011 Third Frontier Program**

**Title: Chemical Kinetics and Emissions from Alternative Fuels**

**Applicant: Air Force Institute of Technology**

**POC: Dr. Marc Polanka**

**AFIT/ENY**

**2950 Hobson Way**

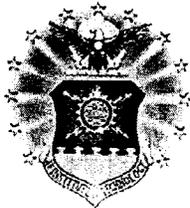
**WPAFB, Oh 45433**

**(937) 255-3636 x4714**

**Marc.Polanka@afit.edu**

**Grant Funds Requested: \$800,000 over three years**

**Collaborators: Spectral Energies, Air Force Research Laboratory**



## **Chemical Kinetics and Emissions from Alternative Fuels**

Over the last several years there has been a high interest in reducing the nation's dependence on foreign oil. One of the promising areas has been in the area of alternative fuels. A major effort has been undertaken spearheaded by the Air Force along with the Department of Energy to develop these fuels. Several fuels such as Fischer-Tropsch have shown promise in meeting the needs of the Air Force. However, there are many other alternative fuels being developed that are not receiving the same attention as the Fischer-Tropsch blends. These fuels need a mechanism to evaluate the fuels being created by Ohio companies. This proposal outlines the capabilities of a research facility that will be integrated at the Air Force Institute of Technology (AFIT) to evaluate these alternative fuels. It is the intent of this effort to team with any Ohio company as well as the Air Force Research Laboratory in understanding reaction rates and overall chemical kinetics of these fuels.

The AFIT Combustion Optimization and Analysis Laser (COAL) Laboratory is well positioned to handle an effort of this magnitude. Over the past several years the laboratory has procured, installed, and validated several optical techniques that will be well suited towards characterizing alternative fuels. These include two line Planar Laser Induced Fluorescence (PLIF) that has specifically been tuned to measuring OH concentrations. By tracking OH, the flame regime can be quantified and the flame temperature calculated. OH radicals can be supplemented with similar PLIF measurements tuned to other species. Velocity measurements using high speed Particle Image Velocimetry (PIV) can further enhance knowledge of the reaction and the flame speed. Data rates in excess of one thousand Hertz are now possible in COAL. A recently installed picosecond Coherent Anti-Stokes Raman Spectroscopy (CARS) can be tuned to further investigate the species concentration and temperature of the relevant reactions. These optical techniques will be balanced with gas chromatograph measurements from our Agilent Technology sensor and chemiluminescence measurements from our California Analytical Instruments system that will enable emissions measurements to be made. Lastly, Chemkin® is available to provide reference reaction rates for the various fuels being tested.

This research effort needs to build a Well Stirred Reactor (WSR) to provide the ability to vary the fuel equivalence ratio, flow rate, and chemistry along with the initial temperature and pressure. These parameters will allow each individual fuel to be characterized over the appropriate ranges found in the operating environment. Designs for a WSR capable of reaching five atmospheres are in hand and will be built with funds from this program. With the existing optical diagnostics and emissions capability in the COAL laboratory the fuels developed by outside sources can be independently evaluated with graduate students from AFIT and scientists from our collaborator Spectral Energies. This will provide an unbiased methodology for comparing fuels and determining the best operational regimes for each fuel.

**Hansen, Andrew**

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**OTFWPP 11-426**

**From:** Edward Orona [eorona@ysu.edu]  
**Sent:** Tuesday, November 30, 2010 10:06 AM  
**To:** OTFWPP2011  
**Cc:** pjkasvinsky@ysu.edu  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** Wright.LOI.YSU.pdf; eorona.vcf

Dear Colleagues:

I am writing on behalf of Youngstown State University. The attached file is the Letter of Intent for the Third Frontier Wright Project program.

Thank you for your attention.

- Ed Orona

--

Dr. Edward Orona

Acting Authorized Institutional Official Director of Grants and Sponsored Programs Youngstown State University One University Plaza, Coffelt Hall Phone 330-941-2377

November 29, 2010

Ohio Department of Development  
Third Frontier Wright Projects Program  
77 South High Street  
P. O. Box 1001  
Columbus, OH 43216

Dear Colleagues:

On behalf of Youngstown State University, this Letter of Intent is being submitted to the Third Frontier Wright Projects Program. The proposed Project is currently entitled: "Smart Grid Proving Ground and Commercialization Infrastructure" and will request an estimated amount of \$1,500,000. Information about the Lead Applicant and Collaborators follows.

**Lead Applicant: Youngstown State University**

**Authorized Institutional Official:**

Dr. Peter J. Kasvinsky

Associate Provost for Research

**Contact person:**

Dr. Edward Orona

Director of Grants and Sponsored Programs

Youngstown State University

One University Plaza

Youngstown, Ohio 44555

phone: 330-941-2377

e-mail: eorona@ysu.edu

**Collaborators:**

The Tech Belt Energy Innovation Center

FirstEnergy Solutions Corp.

The NASA Glenn Research Center

The National Energy Technology Laboratory

NorTech

**Anticipated Collaborators:**

Case Western Reserve University

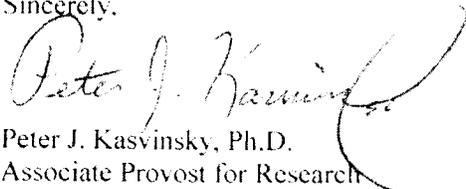
The University of Akron

American Electric Power

Alternative Energy/Electrical Storage partner (TBD)

The Summary of the Proposed Project appears on the next page. We look forward to submitting a full proposal to help support this new collaborative venture. If you have any questions or need additional information, please do not hesitate to contact me. Thank you for your attention.

Sincerely,



Peter J. Kasvinsky, Ph.D.

Associate Provost for Research

c: Dr. E. Orona.

Director of Grants and Sponsored Programs

### *Summary of the Proposed Project:*

This collaborative project will build a test-bed and proving ground for devices and systems that will be attached to the grid. The Tech Belt Energy Innovation Center ("Center") is a non-profit entity charged with the mission of commercializing advanced energy and energy efficient technologies. Within its downtown Warren, Ohio location, the Center will provide infrastructure and technical staff necessary to attach a range of devices, including energy storage, demand-response systems, distributed power generation and control environments. The key technical fields include several areas, such as electrical engineering and computer sciences. Key infrastructure will include a multiprotocol communications-enabled interface to the grid, inversion and frequency modulation equipment necessary to accommodate a range of applications, as well as test stands and related industrial infrastructure necessary to demonstrate, assess and troubleshoot emerging energy technologies.

**Hansen, Andrew**

---

**OTFWPP 11-427**

**From:** Ken Lee OSU [lee.133@osu.edu]  
**Sent:** Tuesday, November 30, 2010 10:11 AM  
**To:** OTFWPP2011  
**Cc:** myers.603@osu.edu; hall.16@osu.edu  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** LOI-wright.pdf

**Importance:** High

The Ohio State University Columbus is pleased to submit the attached letter of intent to the Wright Project competition for fiscal year 2011. We look forward to creating Ohio employment and economic advancement with this lucrative innovative technology.

Prospective Lead Applicant: The Ohio State University Research Foundation  
1960 Kenny Road, Columbus, OH 43210-1063

Lead Applicant's Name: Professor Ken Lee, Director

Address: The Food Innovation Center  
2015 Fyffe Road, Columbus, OH 43210-1007

Phone: 614.292.7797

Email: [Lee.133@osu.edu](mailto:Lee.133@osu.edu)

Known Collaborators: The Ohio BioProducts Innovation Center, Stephen Myers Director. Food Innovation Center alliance Ohio industrial producers.

Anticipated Request: \$3 million

Title: Improved human health by commercial development and deployment of innovative Ohio sanitation technology.

Project: We plan commercial application of a sanitation technology exclusive to the Ohio producers in this academic-industry partnership using an OSU patented invention. Significant improvement of human health nationwide and perhaps worldwide is possible, with an estimated 5,000 deaths per year in the US alone due to these preventable illnesses. Ohio is second only to the state of California in production of the consumer product for which this new technology first applies, so this represents a significant competitive edge for Ohio export if successful. This proposal provides capital for construction of a full scale working machine that provides a realistic commercial test bed for important industrial optimization. This will implement the needed improvement cycle of better, cheaper and faster. Ohio State will assemble a team to investigate the best designs and optimize the technology based on actual use by industry member companies. The Food Innovation Center is recently awarded \$4 million representing faculty researchers in 11 colleges at the nation's largest comprehensive research university. Industry partners of the FIC state a primary benefit is the highly desirable one-stop-shop for assembling multi-disciplinary teams of experts to attack real world problems. The Ohio BioProducts Innovation Center has a five year track record of successful Ohio commercialization in partnership with its agbioscience industry base. This alliance is uniquely capable of advancing this exclusive Ohio technology into a global market.

Respectfully submitted,  
Ken Lee, Professor and Director, Ohio State University Food Innovation Center

Professor Ken Lee, Director for OSU Food Innovation v.614.292.7797 f.614.292.0218 <http://fst.osu.edu/lee>  
cell.614.202.1135 <http://fic.osu.edu>



Tuesday, November 30, 2010

Third Frontier Wright Project LOI  
Ohio Department of Development  
77 South High Street, Columbus, OH 43215

By email: [OTFWPP2011@development.ohio.gov](mailto:OTFWPP2011@development.ohio.gov)  
Subject: 2011 OTFWPP LOI

The Ohio State University Columbus is pleased to submit this letter of intent to the Wright Project competition for fiscal year 2011. We look forward to creating Ohio employment and economic advancement with this lucrative innovative technology.

**Prospective Lead Applicant:** The Ohio State University Research Foundation  
1960 Kenny Road, Columbus, OH 43210-1063

**Lead Applicant's Name:** Professor Ken Lee, Director

**Address:** The Food Innovation Center  
2015 Fyffe Road, Columbus, OH 43210-1007

**Phone:** 614.292.7797

**Email:** [Lee.133@osu.edu](mailto:Lee.133@osu.edu)

**Known Collaborators:** The Ohio BioProducts Innovation Center, Stephen Myers Director.  
Food Innovation Center alliance Ohio industrial producers.

**Anticipated Request:** \$3 million

**Title:** Improved human health by commercial development and deployment of innovative Ohio sanitation technology.

**Project:** We plan commercial application of a sanitation technology exclusive to the Ohio producers in this academic-industry partnership using an OSU patented invention. Significant improvement of human health nationwide and perhaps worldwide is possible, with an estimated 5,000 deaths per year in the US alone due to these preventable illnesses. Ohio is second only to the state of California in production of the consumer product for which this new technology first applies, so this represents a significant competitive edge for Ohio export if successful. This proposal provides capital for construction of a full scale working machine that provides a realistic commercial test bed for important industrial optimization. This will implement the needed improvement cycle of better, cheaper and faster. Ohio State will assemble a team to investigate the best designs and optimize the technology based on actual use by industry member companies. The Food Innovation Center is recently awarded \$4 million representing faculty researchers in 11 colleges at the nation's largest comprehensive research university. Industry partners of the FIC state a primary benefit is the highly desirable one-stop-shop for assembling multi-disciplinary teams of experts to attack real world problems. The Ohio BioProducts Innovation Center has a five year track record of successful Ohio commercialization in partnership with its agbioscience industry base. This alliance is uniquely capable of advancing this exclusive Ohio technology into a global market.

Respectfully submitted,

Ken Lee, Professor and Director, Ohio State University Food Innovation Center

**Hansen, Andrew**

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**OTFWPP 11-428**

**From:** Sunny Sethi [sethisunny@gmail.com]  
**Sent:** Tuesday, November 30, 2010 10:44 AM  
**To:** OTFWPP2011  
**Cc:** Dhinojwala,Ali; Sastry,Shivakumar  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** UniversityOfAkron\_LOI.pdf

Please find attached Letter of Intent for 2011 Ohio Third Frontier Wright Project, for:

Organization: University of Akron  
Project Title: Carbon Nanotube Research Center



**Department of Polymer Science**

College of Polymer Science and Polymer Engineering  
Akron, OH 44325-3909

(330) 972-7542 Office  
(330) 972-5290 Fax

Ohio Department of Development  
Technology and Innovation Division  
77 S. High Street, 25<sup>th</sup> Floor  
Columbus, OH 43215

25-November-2011

Subject: Letter of Intent for 2011 Ohio Third Frontier Wright Project

To whom it may concern:

The University of Akron in collaboration with ADAP Nanotech, LLC is pleased to submit this letter of intent for Ohio Third Frontier, *Wright Project Program 2011*. The specific opportunity of the intended proposal would be Advanced Materials. Programmatic information is provided in the following table. Project summary is provided on page 2 of the letter.

**Lead Applicant  
Contact Person**

The University of Akron  
Ali Dhinojwala, PhD  
H. A. Morton, Professor, Chair  
Department of Polymer Science  
The University of Akron  
Akron, Ohio  
[ali4@uakron.edu](mailto:ali4@uakron.edu)  
330-972-6246

**Project Title  
Estimated grant funds requested  
Known Collaborators**

Carbon Nanotube Research Center (CNRC)  
\$3.0 M  
ADAP Nanotech

Sincerely,

Ali Dhinojwala  
H. A. Morton Professor in Polymer Science  
The University of Akron  
Akron, OH 44325  
Tel: (330) 972-6246  
Fax: (330) 972-5290  
email: [ali4@uakron.edu](mailto:ali4@uakron.edu)  
<http://www2.uakron.edu/cpspe/dhinojwala/>

## Project Summary

We propose to establish automation systems infrastructure for scaling up production of aligned and non-aligned carbon nanotube structures. Carbon nanotubes have unique electrical and mechanical properties which have made them indispensable for a broad spectrum of applications. Several universities and companies located in Ohio, and other part of the Nation, have been developing products based on carbon nanotubes. However the biggest roadblock in commercialization of carbon nanotube based products is manufacturability of various carbon nanotube structures. Scaling up production of carbon nanotube structures requires a focused effort by a team of experts representing chemistry, materials science, and engineering. We have assembled such an interdisciplinary team at The University of Akron who will work in close collaboration with an Ohio based company specializing in carbon nanotube products: *ADAP Nanotech*. The infrastructure and expertise developed in the center will not only allow companies like ADAP Nanotech to compete globally and grow but it would also serve as a preeminent development and commercialization center for carbon nanotube applications. An Ohio-based supply chain for providing automation systems equipment and systems and materials for the manufacture of carbon nanotube structures will be enabled.

The proposed project involves multidisciplinary innovations that result in establishing automation systems infrastructure that would enable synthesis of large areas of aligned carbon nanotubes at high rates. Instrumentation design for online characterization would also be developed. Such online characterization techniques are very important for generating materials with quantifiable properties. ADAP Nanotech will commercialize a new carbon nanotube based adhesives product using this automation systems infrastructure. ADAP Nanotech has developed thermal pads using these novel adhesive structures. The other products would include carbon nanotube based field emission displays, ice repellent coatings and carbon nanotube based batteries. The proposed project will have numerous benefits for Ohio. The technology has the potential to incubate new businesses and attract manufacturing based companies to the area. Such efforts would attract federal funding and private investment in the region. The project will increase local growth of high-tech jobs and talent retention. In the next three years, this infrastructure will stimulate the creation and sustenance of 15-25 full-time jobs in Northeast Ohio.. The workforce would largely be hired from local universities. The new technology will greatly affect Ohio's current industrial base of equipment manufacturers. Ohio's current manufacturers will be able to produce products with greater efficiency and lower cost.

**From:** Hayes-Ozello, Kathleen [Kathleen.Hayes-Ozello@cvm.osu.edu]  
**Sent:** Tuesday, November 30, 2010 11:00 AM  
**To:** OTFWPP2011  
**Cc:** Bertone, Alicia L.; McKenney, Robert; Prof. Dr. Michael V. Knopp; Lairmore, Michael  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** 2011 OTFWPP LOI.DOC

Please accept this Letter of Intent for the Ohio Third Frontier Wright's Project Program on behalf of The Ohio State University Office of Sponsored Programs (Lead Applicant) and Dr. Alicia Bertone (PI).

<<2011 OTFWPP LOI.DOC>>

# Ohio Third Frontier Wrights Project Program

## Letter of Intent

November 30<sup>th</sup> 2:00PM, 2010

The Ohio Department of Development  
Technology and Innovation Division  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, OH 43215  
[OTFWPP2011@development.ohio.gov](mailto:OTFWPP2011@development.ohio.gov)

### **Lead Applicant:**

The Ohio State University  
Office of Sponsored Programs  
1960 Kenny Road, Columbus, OH 43210  
Contact: Jill E. Richards, DVM, CRA, Senior Sponsored Program Officer  
[richards.832@osu.edu](mailto:richards.832@osu.edu)  
614-292-1475

### **Principal Investigator and Contact Person:**

Alicia L Bertone, DVM, PhD, ACVS  
Comparative Cell Therapy Research  
College of Medicine and Veterinary Medicine  
The Ohio State University  
[Bertone.1@osu.edu](mailto:Bertone.1@osu.edu)  
614-292-7449  
Role: Cell Therapy Research and Development

### **Project Title:**

Commercialization of Cell Regenerative Technology

### **Funds Request:**

\$2.5M Wright Capital Funds  
\$0.5M Operating Funds

### **Collaborators:**

#### **OSU**

Wright Center for Innovation in Biomedical Imaging  
College of Medicine  
The Ohio State University  
2050 Kenny Road  
Columbus, OH 43221

Center for Entrepreneurship  
Fisher College of Business  
The Ohio State University  
256 Fisher Hall  
2100 Neil Avenue  
Columbus, OH 43210

#### **For-Profit Business Partners**

Cardinal Health  
7000 Cardinal Drive  
Dublin, OH 43017

Battelle Memorial Institute  
505 King Avenue  
Columbus, OH 43201

### ***GMP Facility for Cell Processing***

We propose a collaborative economic development program that proactively fills a regulatory/safety and marketing gap for the medical application of cell regenerative technology. Our program will pair exceptionally with already established OSU initiatives and expertise to optimize the impact and success of the funds requested in this OTF proposal. Our plan supports the OTF investment in the Wright's Center for Innovation in Biomedical Imaging in the state of Ohio. Our goal for economic development, new jobs, and commercialization is to establish an Ohio-based GMP (Good Manufacturing Practices) FDA (Food and Drug Administration)-certified facility (CellSite™) for distribution, processing and storage of cells used for commercial enterprise, diagnostic medical imaging and innovative regenerative medicine. CellSite™ will create a facility for commercial entities to generate cell products and market services of cell biomedical therapy. OTF investment in our proposed facility will synergize immediately with previous Ohio investment in the Third Frontier Programs; "Wright Center of Innovation in Biomedical Imaging" and "Center for Stem Cell and Regenerative Medicine". The proposed central location of this facility adjacent to the OSU campus will uniquely capitalize on established corporate and third frontier investment in: 1) GMP infrastructure for biomedical imaging, 2) an explored scientific and business model in animal regenerative medicine for research and veterinary application, 3) a robust medical, research and business community for intellectual property (IP) development, and 4) Ohio Board of Regents investment in business academic education. OSU will establish CellSite™ and work collaboratively with our business partners for the entity to grow into corporate independence, as well as establish spin-off companies for sustainable growth of the program. Our established Ohio-based commercialization partners will provide the corporate management and distribution infrastructure, as well as invest in product development.

### ***Business Proposal Summary***

The OSU location of this project capitalizes on the unique central resource of a comprehensive medical, dental, and veterinary Health Sciences Center. Commercial entities will invest in the human applications due to the immediate gap filled by such an FDA approved center that meets regulatory standards for manipulation and manufacturing of cellular devices (i.e. bench cell sorting technologies), cellular products (cell-based off the shelf injectables and scaffolds), gene therapy products with a cellular component (growth factor engineered cells) or any combination product resulting in a biologic drug or device. An investment of capital by the OTFWPP; matched by capital from corporate partners and commitments from OSU will be used to build CellSite™, hire business management, and establish the commercial use of proven cell therapy for tissue regeneration in animals and humans.

**From:** Jeff Bauer [jbauer@shawnee.edu]  
**Sent:** Tuesday, November 30, 2010 11:00 AM  
**To:** OTFWPP2011  
**Cc:** Larry Miller  
**Subject:** 2011 OTFWPP LOI  
**Attachments:** image002.jpg; 2011 OTFWPP LOI Shawnee State University.docx

November 30, 2010

The Ohio Department of Development  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, Ohio  
[OTFWPP2011@development.ohio.gov](mailto:OTFWPP2011@development.ohio.gov)

Subject: 2011 OTFWPP LOI

Lead Applicant: Shawnee State University  
940 Second Street  
Portsmouth, OH 45662  
(740) 351-3176

Contact person: Dr. Larry Miller, Professor Plastics Engineering Technology  
[lmiller@shawnee.edu](mailto:lmiller@shawnee.edu)

Project Title: Development of conductive foams for Biotelemetry Sensors

Estimated Grant

Funding: \$2,000,000

Known Collaborators: Ovation Polymers (aka OPTeM Inc.), Cleveland Medical Polymers, Inc. (CMP) and the Center for Multifunctional Polymer Nanomaterials and Devices (CMPND)  
More collaborators will be added as the project develops.

**Key Primary Scientific/Technical Fields:** Advanced Materials, specifically nanomaterials for medical applications.

### **Summary of Proposed Project**

In this project, we will explore OpteSTAT™ technology along with other nano-additives and fillers to make conductive foams. These foams will be produced via extrusion, RIM and molding processes. They will be used to detect bio-signals for medical applications. CMP will integrate these conductive foams into their established modular networked sensor platform. This product will be commercialized into day-to-day health monitoring and sports applications.

Ovation polymers OpteSTAT™ proprietary dispersion technology is based on Carbon nanotubes-polymer compounds. This has led to a broad family of nanotechnology-based polymer compounds having exceptional properties such as uniform and high electrical and thermal conductivities. Additionally, the OpteSTAT™ products retain the characteristics of the base polymer resin which is advantageous for melt processing into various forms.

Cleveland Medical Polymers Inc. (CMP) provides NanoSenSys™, a user-transparent system for real life biotelemetry which greatly improves the quality of life and accuracy in all application areas that need vital signs and physiological monitoring. The sensor platform is a modular, customizable product that caters to a wide variety of user requirements for real time bio-monitoring enabling rapid clinical intervention.

Respectfully submitted,

*Jeffrey A. Bauer*

Dr. Jeffrey A. Bauer, Interim Dean for Research and Community Development  
Shawnee State University  
940 Second Street  
Portsmouth, OH 45662-4303  
Office: 740-351-3421  
Cell: 740-935-0726  
Email: [jbauer@shawnee.edu](mailto:jbauer@shawnee.edu)

November 30, 2010

The Ohio Department of Development  
77 South High Street, 25<sup>th</sup> Floor  
Columbus, Ohio  
[OTFWPP2011@development.ohio.gov](mailto:OTFWPP2011@development.ohio.gov)

Subject: 2011 OTFWPP LOI

Lead Applicant: Shawnee State University  
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Portsmouth, OH 45662  
(740) 351-3176

Contact person: Dr. Larry Miller, Professor Plastics Engineering Technology  
[lmiller@shawnee.edu](mailto:lmiller@shawnee.edu)

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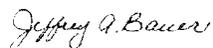
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Respectfully submitted,



Dr. Jeffrey A. Bauer, Interim Dean for Research and Community Development  
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940 Second Street  
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