

Campus STEM Research Priorities University of New Orleans

I. Identification and Definition of Priority Research Areas

UNO Priority Research Area: Advanced Materials – the Advanced Materials Research Institute (AMRI, <http://amri.uno.edu>) is a multidisciplinary, internally recognized research institute in materials chemistry and nanoscience which aligns with the Materials & Chemicals High Growth Target Industry and several Core Industry S&T Sectors including Petrochem, Energy & Environ, Transport, Constr & Mfg and Aerospace. The Translational Research Domains span Energy, Environmental, Digital and Biomedical and the Core Enabling S&T Research includes Materials Science, Nanotechnology, Information Technology and Biotechnology. The institute includes nationally-recognized faculty from the Colleges of Science and Engineering.

	AMRI	
# PIs	9	
# Co-PIs	1	
	Award Count	Award Amount
Federal	6	\$8,222,499.00
State	9	\$6,546,171.00
LA University		
Local		
Business	3	\$155,990.00
Foundation		
University	1	\$120,705.00
Foreign		
Internal	2	\$146,803.00
TOTAL	21	\$15,192,168.00

Additional Data:

Gabriel Caruntu, an Assistant Professor in the Department of Chemistry and Advanced Materials Research Institute (AMRI) at the University of New Orleans, has been awarded a Faculty Early Career Development (CAREER) grant from the National Science Foundation (NSF). This award is considered one of the NSF's most prestigious awards and is given to "junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research." The 5-year, \$600,000 grant will go to support Prof. Caruntu's research program. Dr. Caruntu is the third Chemistry/AMRI faculty member to receive the award following Dr. Zeev Rosenzweig and Dr. Ferdinand Poudeu-Poudeu.

The AMRI Outreach Summer Research Program, a very successful summer program came to a close on July 22 with a Poster Session and a Cook-Out for the participants, faculty sponsors, students and invited guests. The composition of our program this year consisted of 29 participants: 16 undergraduate students, 3 high school teachers, and 10 high school students in our program. Also participating in our program as faculty sponsors/mentors were 17 UNO faculty members. Funding for our summer research program this

year is provided by the National Science Foundation (through NSF-Research Experiences for Undergraduates, Award Nos. DMR-1004869 and through NSF-CAREER Award No. DMR-0954817); and by the Louisiana Board of Regents [through Post-Katrina Support Fund Initiative, Award No. LEQSF(2007-12)-ENH-PKSFI-PRS-04, and through the LA-EPSCoR RII Award No. NSF(2010-15)-RII-UNO (also known as LA-SiGMA), and LA BoR Award No. LEQSF(2010-13)-RD-A-18.

A complete list of publications and presentations by AMRI researchers is available at: http://amri.uno.edu/Papers_and_Presentation.html

Success Stories:

NanoPrism Technologies, Inc. founded by Dr. Charles O’Connor, Director of AMRI, integrates innovative scientific and technological expertise as an emerging nanotechnology-based solutions provider of advanced magnetic nanomaterials for applications which meet the economic, medical and environmental standards of the new century. The company's technologies are currently being qualified and adopted by innovation-driven market leaders in coatings, medicine and health care, catalysis, pigments, electronics and magnetic data storage.

The Institute of Electrical and Electronics Engineers (IEEE) Magnetics Society held its 2011 Summer School at the University of New Orleans and AMRI on May 22-28, 2011. The summer school program is an annual event held around the world designed for graduate students studying magnetism and related areas. It consists of lectures by international experts and includes poster presentations by participating graduate students. The program typically covers fundamentals and advanced topics in magnetism. The program was attended by 100 graduate students, representing 23 countries and 5 continents. The lectures/classes were conducted by 11 international experts and included two of our own faculty, Prof. Leonard Spinu and Prof. Leszek Malkinski. The 2011 session was held on UNO's Lakefront campus at the Lindy C. Boggs International Conference Center.

UNO Priority Research Area: Information Assurance and Cybersecurity – The Greater New Orleans Center for Information Assurance (GNOCIA) is a nationally recognized center in information assurance and cybersecurity which aligns with the Cybersecurity High Growth Target Industry, the Info Tech & Services Core Industry S&T Sector, the Digital Translational Research Domain and the Computer Science and Information Technology Core Enabling S&T Research areas. The center involves nationally-recognized faculty from the Department of Computer Science.

	GNOCIA	
# PIs	2	
# Co-PIs	0	
	Award Count	Award Amount
Federal	2	\$940,618.00
State		
LA University		
Local		
Business		
Foundation		
University		
Foreign		

Internal		
TOTAL	2	\$940,618.00

Additional Data:

For the past two years, Professor Golden G. Richard III of GNOCIA and the UNO Computer Science Department has collaborated with representatives of the Communities in Schools: ScienceREACH program to introduce students at local high schools in the New Orleans area to topics in Information Assurance, concentrating on digital forensics. Prof. Richard visits each school, delivers a one hour presentation to a selected group of students, and introduces digital forensics as a scientific field and as a potential career choice. A field trip is then coordinated that allows the students to visit the laboratory facilities in the Greater New Orleans Center for Information Assurance (GNOCIA) at UNO and perform a mock forensic investigation under the tutelage of GNOCIA faculty and graduate students. Most recently, in February 2012, students from G. W. Carver High School visited UNO for a tour of the facilities and to gain experience with real digital forensics tools.

A list of publications, presentations and grants-in-force is available at: <http://www.cs.uno.edu/>

Success Stories:

GNOCIA faculty have been the primary principal investigators on numerous federal awards in support of SSC-LANT. SPAWAR Systems Command Atlantic (SSC-LANT) has a facility in the UNO Research and Technology Park providing a shared services (computing) environment for federal customers. UNO has supported the SSC-LANT facility through several contracts over the past several years and currently has two open contract vehicles. One contract is for \$50m over 5 years (UNO is currently in the third year) with UNO as the prime, and provides a mechanism for local IT businesses to aid in that effort. The second contract is for \$30M over 6 years and is a multiple award contract between UNO and six other universities and SSC-LANT in Charleston, SC. No task orders have been issued yet on the second contract. On the first contract, UNO has completed 19 task orders. Total amount of all contracts: \$14,262,500.00; Number of UNO employees on SPAWAR contracts: 133; Number of businesses supported: 5; Total amount of subcontracted to businesses: \$8,931,013.00; Number of UNO students who have completed internships with either SSC-LANT or these businesses: 11

The University of New Orleans has the strongest Information Assurance (IA) program in the region and is designated as a National Center of Academic Excellence (CAE) in Information Assurance Education (CAE) and Research (CAE-R) by the National Security Agency (NSA) and the Department of Homeland Security (DHS)—the only university holding these designations in the State of Louisiana. Attaining these designations from these two federal agencies is a success story.

UNO Priority Research Area: Coastal Resilience – The Center for Hazard Assessment, Response and Technology (CHART) and Pontchartrain Institute for Environmental Sciences (PIES) are two multidisciplinary groups working on two aspects of coastal resilience: community resilience and coastal/wetlands research. These units work in the Coastal Resilience High Growth Target Industry, the Energy & Environ Core Industry S&T Sector, the Coastal and Environmental Translational Research Domains and the Information Technology and Bioscience/Biotechnology Core Enabling S&T Research areas. The center and institute include nationally and internationally-recognized faculty from the Colleges of Liberal Arts and Science.

	CHART	
# Pls	4	
# Co-Pls	3	
	Award Count	Award Amount
Federal	1	\$63,306.00
State	3	\$1,871,509.00
LA University		
Local		
Business	3	\$149,281.00
Foundation	1	\$136,329.00
University	1	\$64,969.00
Foreign		
Internal		
TOTAL	9	\$2,285,394.00

	PIES	
# Pls	9	
# Co-Pls	1	
	Award Count	Award Amount
Federal	6	\$4,105,240.00
State	4	\$423,318.00
LA University	3	\$164,556.00
Local	1	\$9,500.00
Business	8	\$818,251.00
Foundation	6	\$648,904.00
University	2	\$134,999.00
Foreign		
Internal	1	\$70,000.00
TOTAL	31	\$6,374,768.00

Additional Data:

UNO-CHART hosted a booth for an international audience of public and private disaster industry professionals on January 17-19, 2012, in New Orleans, LA, at the International Disaster Conference & Expo (IDCE 2012.) The International Disaster Conference and Exposition (IDCE 2012), held at the New Orleans Ernest N. Morial Convention Center, brought together emergency management, homeland security and disaster industry professionals from the public and private sectors around the world.

CHART has developed the Risk Literacy Manual. The "[Preparing for Storms in Louisiana](#)" manual is designed in plain language to teach the concepts of risk as subject matter in literacy programs and vice versa, teach literacy through risk education. The manual can be downloaded from http://scholarworks.uno.edu/cgi/viewcontent.cgi?article=1002&context=chart_pubs

A complete list of project reports, journal articles, books and book chapters for CHART researchers is available at: <http://www.uno.edu/chart/Publications>

Success Stories:

UNO-CHART has been funded by FEMA through the Governor's Office of Homeland Security and Protection (GOHSEP) to implement mitigation outreach and education projects intended to inform citizens, business owners, non-profit organizations, and local officials about the risks to which they are vulnerable and ways in which those risks can be reduced through multiple mitigation methods. Each of the following five projects will work towards increasing the overall awareness of the ability to address potential disasters before they happen: *Continuity Contingency Planning and Mitigation for Community Organizations: Businesses, Government Agencies, Faith Organizations and Non-Profit Groups; Campus-Wide Coastal Hazards Resiliency Curriculum & Development of Hazard Mitigation Planning Curriculum; Risk Literacy; Disaster Resilient University State-Wide Conference; Community Executives Program in Storm Risk Management.*

PIES is conducting key research in coastal restoration and protection to provide a safer environment for Louisiana in general and the Greater New Orleans area parishes in particular. UNO is a primary participating institution in the Coastal Sustainability Consortium (CSC). UNO is also a member of the Louisiana Universities Gulf Research Collaborative which is working to bring BP funding to state researchers. PIES continues to work with several state agencies, including the Office of Coastal Protection and Restoration, Department of Natural Resources, and Department of Wildlife and Fisheries, and companies with projects in coastal restoration and located within the UNO Research and Technology Park. PIES maintains the Coastal Louisiana Resource Information System (CLARIS) which provides interactive GIS maps of coastal Louisiana (www.ladigitalcoast.uno.edu) and the Pontchartrain Basin Clearinghouse (www.pbc.uno.edu) which provides web-accessible information on the Lake Pontchartrain basin to government agencies and public/private organizations. Working to maintain a safe environment is critical for companies located here now and for companies that the state and region are trying to get to locate here for future economic development.

UNO partnered with DQSI, a tenant in the UNO Research and Technology Park, on a NASA SBIR proposal submission titled, "Distributed GIS Computing for High Performance Simulation and Visualization". In February 2011, this proposal was awarded a Phase 1 SBIR grant. DQSI and UNO (under a subcontract to DQSI) will be researching and developing high performance computing which will address NASA's mission for Earth Science Applied Research and Decision Support. Collaborators on the project include UNO's Pontchartrain Institute for Environmental Research and the Louisiana Optical Network Initiative (LONI).

UNO Priority Research Area: Naval Architecture and Marine Engineering – The School of Naval Architecture and Marine Engineering in the College of Engineering has several nationally and internally-recognized faculty working on advanced ship and autonomous vehicle design and construction including titanium alloy materials. This research aligns with the Materials & Chemicals

High Growth Target Industry, the Transport, Constr & Mfg Core Industry S&T Sector, the Energy, Environmental and Digital Translational Research Domains and the Materials Science and Computational Science Core Enabling S&T Research areas.

	NAME	
# PIs	4	
# Co-PIs	3	
	Award Count	Award Amount
Federal	3	\$6,530,478.00
State		
LA University		
Local		
Business	5	\$1,132,540.00
Foundation		
University	1	\$1,382,000.00
Foreign	1	\$217,394.00
Internal		
TOTAL	10	\$9,262,412.00

Additional Data:

The UNO e-boat team placed 2nd at the annual SOLAR SPLASH World Championship of Intercollegiate Solar Boating. Congratulations to the team of NAME and EE students lead by Danial Givan (captain) and Ryan Thiel (Faculty advisor). Again UNO presented the fastest boat on the water. Pictures and detailed results can be found at <http://www.solarsplash.com/index.php>.

A complete list of publications for NAME can be found at: <http://www.name.uno.edu/research/publications.aspx>

Success Stories:

UNO has been awarded a 10-year \$3 million contract as one of three American university partners on a South Korean shipbuilding research project. UNO, the University of Michigan and the University of Maryland were selected to work with one of South Korea’s two Global Core Research Centers. The centers will focus on research opportunities within South Korea’s two major export industry sectors: shipbuilding/marine structures and electronic industries. The centers will be operated by a lead university in South Korea with a consortium of academic institutions and South Korean manufacturers. A portion of the research funding is allocated to overseas consortium members, including UNO. The UNO principal investigator is Pingsha Dong, the Northrop Grumman Endowed Chair in Shipbuilding and Engineering and director of the Welded Structures Laboratory. Dong, an internationally renowned engineer, will provide advanced research in the areas of welding; fatigue design and analysis; and structural assembly procedures for marine structures.

The Office of Naval Research has awarded NAME a \$4.8M grant to advance the science and technology of titanium shipbuilding. The research will be focused on the manufacturability and structural performance of a titanium mid-ship section. Titanium alloys offer many advantages for ship hull applications compared to traditional structural steels and aluminum alloys. According to NAME Professor Pingsha Dong, with recent advances in welding and math-based design for fabrication techniques, this project represents perhaps the most comprehensive exploration of state-of-the-art technologies to date by actually building a full-scale titanium mid-ship section. Dong is an internationally renowned researcher in the area of welded structures.

II. Institutional and External Support for Priority Research Areas

A. How do identified priority areas reflect the mission and vision of the campus?

The mission and vision of the campus are contained in the 2011-2014 Strategic Plan for the campus. The Strategic Plan identifies Centers of Excellence for the university and each of the High Priority Research Areas listed above are supported by one of more of those centers. The vision statement states that the university will “focus on attracting new faculty in strategic academic areas” and “support our goal to be an urban research university of national stature.” Goals, objectives and strategies to support that vision are further defined in the Research section of the Strategic Plan.

B. How do/will the institution’s internal funding structures reflect and manifest these priorities (e.g., cluster hiring, strategic investments, infrastructure development, graduate fellowships/fellowship supplements, etc.)?

The UNO Office of Research and Sponsored Programs manages a summer research program and the Vice President for Research is also the decision-maker on other internal funding including direct support of research projects, cost-sharing on proposals, start-up for new hires and lab/space renovations. The VPR meets with many potential faculty hires and is included in the search process for Deans and above. The VPR also funds supplements to the BoR SREB doctoral fellows and the dissertation/thesis improvement program for graduate students. In making these decisions the VPR is cognizant of the Centers of Excellence and Strategic Plan, as well as potential funding opportunities and the role of the university in economic development.

C. How does existing and/or potential external funding relate to these priorities?

Existing funding is strongly correlated with these priorities. For the research priorities identified above the total number of current awards (as of 5/16/2012) is 73 for a total of \$34M. Of these 18 are federal awards totaling \$20M. According to the latest Grad Act report for UNO the five year rolling average ending in FY11 of all R&D expenditures was \$30.3M and the amount of that funding in Louisiana’s key economic development industries was \$17.7M or 58% of the funding. Based upon faculty hires and national funding trends we expect that percentage to increase.

III. Research and Economic Development Data

Campus-wide Economic Development Data (reported annually through the research commercialization databank and aligned with AUTM metrics): Activities related to economic development productivity over the past five years⁺, including

	FY09	FY10	FY11	FY12	FY13
A. Disclosures	6	7	9		

B. Patents awarded	0	4	2		
C. Licenses/Options awarded	3	3	2		
D. Licensing income	\$31,576	\$75,311	\$58,845		
E. New start-ups (existing)	0 (1)	1 (1)	0 (2)		
F. # of industry-sponsored research agreements					
G. Industry-generated R&D expenditures*	\$682,000	\$1,803,000	\$2,038,000		

+In keeping with Grad Act reporting items A thru F below are for the FY indicated and are not five year rolling averages. Also, Grad Act reporting has only included past three years. The next Campus STEM Research Priorities Report will include past five years of data.

*As reported in the Grad Act the industry-generated R&D expenditures are a five-year rolling average so FY09 listed above is for years FY05-FY09, etc.