AMRI NEWSLETTER

Advanced Materials Research Institute

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THE DIRECTOR'S CORNER

AMRI has been quite active in the first quarter of 2016. First, the Department of Chemistry and AMRI have begun to search for a new Materials Chemistry faculty member. Though we are outside the normal recruiting cycle, we have already received some exceptional applications. This hire, to start in August, is needed to help strengthen the department and the institute, both of which have lost faculty in recent years due to attrition and retirements. Also exciting is that the renovations on the Science Building have begun – repairs have started to the roof, and new air conditioning components are being installed. New fume hoods for AMRI research and Chemistry teaching laboratories are scheduled for installation beginning in late spring or early summer. Further, the AMRI FACS--Fabrication, Analysis, and Consulting Services has begun to take initial contracts to help generate some needed revenue; more information about FACS is available online at www.uno.edu/amri/amri-facs/. In terms of events, on February 4, we held our Annual AMRI Review in the University Center (see below). Faculty researchers and students presented their various technical accomplishments; especially noteworthy was the afternoon poster session where graduate and undergraduate students presented their results – the quality and quantity of work was truly impressive.

--John B. Wiley

Lighting the Way to a New Electronics Paradigm

Weilie Zhou's group (including former Dr. Satish Rai and Dr. Kai Wang) here at the University of New Orleans, working with researchers (K. Marmon and Prof. Yong Zhang) at the University of North Carolina, Charlotte (UNCC), have developed a light effective transistor (LET) which is an alternative device of the well-known field effect transistor (FET), a critical component in much of modern electronics - from TV's to computers to cell phones - and is the basis for most circuits. This LET device will offer some of the same advantages of FET, but it can lead to faster, smaller circuitry that requires less cooling. The article "Light-Effect Transistor (LET) with Multiple Independent Gating Controls for Optical Logic Gates and Optical Amplification" was published in *Frontiers in Physics: Optics and Photonics* and has been highlighted in MTI Technology Review:

https://www.technologyreview.com/s/600702/the-nanodevice-aiming-to-replace-the-field-effect-transistor/)

as well as the website:

www.physics4thecool.com. This new technology may lead to great advances in electronic devices in the near future.

IFM Director Visits AMRI

Dr. Niel Crews flew from Ruston to New Orleans to visit AMRI on February 17. Dr. Crews is the Director for the Institute for Micromanufacturing (IfM) at Louisiana Tech University where he heads up micro- and nanotechnology research. He is an expert in microfluidic thermal systems for biological applications and is involved in outreach programs throughout the region to encourage young people in science, technology, engineering, and mathematics (STEM).

The Institute for Micromanufacturing provides extensive research labs, offices, and cleanroom space, equipped with state-of-the-art micro- and nanofabrication equipment and characterization tools available for research. Many of the capabilities of IfM complement those of AMRI. Dr. Crews visited Dr. John Wiley, the Director of AMRI, to discuss the possibility of collaborating together on several projects in the near future, including a formal agreement between IfM and AMRI for routine utilization of AMRI equipment by IfM faculty.

Dr. Neil Crews, Director of Institute for Micromanufacturing (IfM) at LA Tech University, with his plane.

Undergraduate Chemistry Student Wins Award

Congratulations to Cynthiya Shrestha who recently received an award for her oral presentation at the 4th annual *InnovateUNO* competition. Under the mentorship of Dr. John Wiley, she presented research on Graphene Oxide Nanostructures within the Mechanical Engineering/Chemistry division. This event was held on February 26 at the UC Center Ballroom in order to showcase student creativity and research abilities. Cynthiya will go on to represent the University of New Orleans at the Statewide University of Louisiana Academic Summit.

Cynthia Shrestha, winner of oral presentation at 4th annual *InnovateUNO* competition.

Annual AMRI Mardi Gras Review 2016

AMRI recently hosted its annual conference on February 4, 2016 in the Innsbruck Suite of UNO's University Center. Faculty and students summarized and displayed their research efforts from 2015. The program began with continental breakfast and an introduction and overview of the institute by Dr. John Wiley, the Director of AMRI and President's Research Professor of Chemistry. Several

presentations given by AMRI faculty followed. The topics covered nanomaterials research including the use of nanostructured materials to fabricate sensors, assembly of nanopeapod structures, and product properties through coupling between spin crossover and ferroic phases. Other items on the agenda involved information about programs geared for undergraduate students such as the NASA supported educational programs at the University of New Orleans and the AMRI Summer Outreach Research Program. These research efforts were sponsored by the LA Board of Regents, the National Science Foundation, the Defense Threat Reduction Agency, and the Department of Energy. The day concluded with a poster session and the traditional culinary treat of Mardi Gras, king cake. Graduate and undergraduate students displayed posters that showcased all their hard work.

Clare Davis-Wheeler shares her research poster at the Annual Mardi Gras Review.

Dr. Kevin Stokes explains the finer points of Physics Department NASA educational programs.

Students and Faculty engaged attentively in the Annual Review of AMRI research.

New Faces at AMRI

AMRI welcomes Leonie Berthonnaud, Paul Renquet, and Laetitia Couchaux three undergraduate level exchange students from France, to the AMRI and Chemistry labs at UNO. Leonie and Laetitia will work with Dr. Matthew Tarr's research team and Paul with Dr. John Wiley's team.

AMRI Gears Up for Summer Outreach Research Program

AMRI recently reached out to high school students by attending the Bard Early College High School Internship Fair in February. AMRI has been accepting applications for the yearly Summer Outreach Research Program for undergraduates and

high school students. This will be the 14th year that AMRI has been able to organize the program designed to recruit new students into the sciences and generate interest in Materials Science. Six undergraduate students as well as six high school students will be selected to work alongside AMRI faculty, students, and researchers in the 8-week program.

AMRI Represented at Annual Spring Explore UNO Event

AMRI participated at an annual spring event which displays educational and research opportunities available to students at UNO. Over 600 people, including 245 students, attended the event on campus on Saturday, February 27, 2016. Dr. John Wiley and Dr. Weilie Zhou helped to represent AMRI at this event held twice a year in the UNO Recreation and Fitness Center courts. This year was particularly successful with more than double last year's previous attendance.

Dr. Wiley describes AMRI research opportunities available for undergraduate students at the recent Explore UNO event.

Annual Chemistry Barbecue

The Chemistry Department recently held its Spring Barbecue and Poster Competition as it does every year. This year's poster awards are as follows:

Student/Division*	Award	Mentor
Undergraduate		
Michael Retana	1st Place	Zhou
Nichole Pianovich	2nd Place	Jursic
Gaurav Gyawali	3rd Place	Spinu?
Jacqueline Smith	3rd Place	Rick
Junior Graduate		
Sean Carson	1st Place	Jursic
Ryan McKinnie	2nd Place	Trudell
Alexis Blanco	2nd Place	Wiley
Senior Graduate		
Sara Akabarian-Tefaghi	1st Place	Wiley
Shuke Yan	2nd Place	Zhou
Lea Gustin	3rd Place	Wiley

The barbecue was held on Monday, March 21, 2016 in CSB 101.

Dr. Mark Trudell presenting award to Sara Akbarian-Tefhagi at the Annual Chemistry Barbecue and Poster Competition.

Publications

"Light-effect transistor (LET) with multiple independent gating controls for optical logic gates and optical amplification" J. K. Marmon, S. C. Satish, K. Wang, Weilie Zhou and Y. Zhang, Frontiers in Physics vol.4 (http://dx.doi.org/10.3389/fphy.2016.00008).

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