AMRI NEWSLETTER

Advanced Materials Research Institute

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THE DIRECTOR'S CORNER

A number of important events have been ongoing in AMRI during this quarter. First, AMRI is expanding – the Departments of Chemistry and Mechanical Engineering have successfully completed faculty searches and both have hired new faculty with interests in materials. These new tenure-track faculty members will start in August and are expected to be major contributors to AMRI efforts. Second, congratulations to Professor Leszek Malkinski for obtaining a Louisiana Board of Regents enhancement grant. Prof. Malkinski (lead PI), along with other AMRI faculty, successfully secured $136,000 to buy a microwriter system. This equipment, which will be located in AMRI's Class 100 cleanroom, will allow AMRI researchers and outside users to make their own masks for thin film growth and microfabrication applications. Also ongoing is our annual summer research program involving high school and undergraduate students. This program will culminate with student poster presentations and a barbecue on July 29th – all are welcome (if you are coming from off campus, please RSVP to AMRI@uno.edu). Science building renovations are progressing well with new roofing, AC units, and hoods; completion of this work is set for January 2017, but several projects are ahead of schedule. Also exciting has been the availability of FEMA funds to buy small equipment within the Institute. These funds have been quite important, helping to address some badly needed smaller ticket items; purchases so far have included dry pumps, a centrifuge, chiller, water purifier, and a small press. Also of interest, *and a place where we could use your help*, is the expansion of our AMRI alumni list. The office staff, Poncho De Leon and Jennifer Tickle Nguyen with the new student worker, Wizel Abdel-Fattah, have been working to compile an extensive list of AMRI alumni and collaborators. If you have contact information for various Alumni that you know we lack, please forward it to us so we can add them to our list. Finally, AMRI says farewell to one of our first faculty members, Kevin Stokes. Kevin has taken a position at Kennesaw State University, Georgia, as their new Physics Chair. Kevin's contributions to AMRI and Physics have been extensive and he will be missed very much. We wish him the very best.

New Materials Faculty Hired

Dr. Viktor Poltavets

Two new materials faculty, Dr. Viktor Poltavets (Chemistry) and Dr. Damon Smith (Mechanical Engineering), have been hired as tenure-track assistant professors here at the University of New Orleans. Dr. Poltavets, a native of the Ukraine, received his M.S and Ph.D. degrees from Moscow State University (Russia). He then worked as an Alexander von Humboldt Foundation fellow at the Max Planck Institute for Solid State Research (Stuttgart, Germany) and a postdoctoral scholar at Rutgers University (Piscataway, New Jersey). Dr. Poltavets joins us from the Department of Chemistry at Michigan State University. His research at UNO will involve new battery materials and heterogeneous catalysis.

Dr. Smith, an alumni of UNO, received his B.S. and M.S. in Physics working with Professor Kevin Stokes. He then moved to the University of Texas (UT), Austin, where he completed a doctorate in Materials Science working on semiconductor

Dr. Damon Smith

nanomaterials. Over the last 6 years, he has worked as Senior Research Scientist and Facility Manager of the UT Austin's Center for Nano and Molecular Science where he has managed the laboratory's more than 30 analytical and nano/micro fabrication tools and served as the primary consultant on experimental design. Dr. Smith will work in the area of nanomaterials development**.**

Renovations and Lab Clean Up

The renovations in the Science Building are well underway. The project involves the repair and replacement of the entire roof, the replacement of all four air conditioning units, the replacement and installation of various hoods in AMRI research and Chemistry teaching labs, and the installation of two central blower units on the roof. The entire project is expected to be completed by January 2017. The roof repairs are progressing and currently involve the removal of the old roof and duct work. This has been a special challenge for AMRI in that the work has created a number of new leaks – the good news is that the contractors are usually able to quickly address such leaks, though many pieces of AMRI equipment are covered in plastic "just in case." With respect to the AC units, two have been completely replaced and another installation is almost complete. The replacement of the fourth unit will take place in late July and this is the one that will directly impact the AMRI labs and offices. In terms of hoods, a number of the teaching and research labs have already had their hoods removed and the new units have arrived; installation is just underway.

New fume hoods outside teaching labs on first floor of the Science Building

In addition to the lab renovations, AMRI researchers are working to clean up labs throughout the Institute. This has involved the decommissioning of old equipment, shifting equipment to make it more accessible to researchers, organizing reagents, and disposing of chemical waste. The latter has been a major undertaking in that some labs have several years of various liquid and solid samples left by previous researchers. Mark Granier working with Taha Rostamzadeh and Sara Akbarian have been essential is disposing of the various agents.

Taha Rostamzadeh (left, Chemistry Graduate student), Mark Granier (middle, AMRI Lab Research Assistant), and John Wiley (Director) during the lab clean up.

2016 AMRI/Chemistry Summer Outreach Research Program

The 2016 AMRI/Chemistry Summer Outreach Research Program began with an orientation meeting on May 31 for 6 undergraduate students, who were joined by 5 high school students on June 6. The summer program will run through July 29, when the student participants will present their research at a poster session display and barbecue cook-out.

This outreach research program has taken place every summer since 2002, when it began as a program for high school students and teachers. The next year, 2003, it was expanded to include undergraduate students. This summer program is designed to increase the awareness and understanding of scientific research among undergraduates, high school students and teachers. No prior research experience is required for participation.

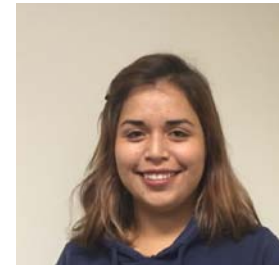
Participants are conducting research each on an independent project in chemistry, physics, biology, or materials science. They attend weekly seminar programs that allow for discussion of current scientific issues, general research concepts, and scientific ethics.

Summer Outreach Program Participants

NSF-REU Undergraduate Participants

Amber Carpenter attends the University of New Orleans and is working with Dr. Steve Rick on developing coarse grained computational models for polymers.

Mina Hibino from the University of New Orleans works with Dr. Matt Tarr on the use of albumin in drug-loaded nanoparticles.



Ramona Luna attends University of Texas at Rio Grande Valley and works with Dr. Weilie Zhou researching asymmetric supercapacitors.

Rebecca Mitton attends University of Dallas and works with Dr. John Wiley on synthesizing $BaTiO_3$@hexaniobate nanopeapods.

Terrell Shields attends the University of New Orleans and works in Dr. Steve Rick's group on computational modeling of the collective motions of water.

Renee Stover attends Oregon State University and works with Dr. Matt Tarr on the photocatalytic activity of anthraquinone and how it could be used to break down pollutants.

High School Participants

Julia Simon attends Lusher Charter High School and works with Dr. Matt Tarr on the use of albumin in drug-loaded nanoparticles.

Adriana Silva attends John Ehret and works with Dr. John Wiley on the optical and photocatalytic properties of Pt nanoparticles and nanopeapods.

Maansi Solanky attends St. Marten's High School and works with Dr. Weilie Zhou on the synthesis of ZnO nanowires.

Connor Travis attends Benjamin Franklin High and works with Dr. Leonard Spinu on the study of magnetic properties of coupled magnetic systems.

Jasmyn Truong attends Mt. Carmel High and works with Dr. Wendy Schluchter on an enzyme involved in light harvesting.

Dr. Malkinski Awarded New Grant from Louisiana Board of Regents

Congratulations to Dr. Leszek Malkinski who recently secured a new state grant from the Louisiana Board of Regents. The purpose of the funding is to enhance multidisciplinary research through the acquisition of a micro-writer. A micro-writer is a piece of equipment that contains a laser beam that can etch on metal substrates at a micron resolution which is one millionth of a meter scale. The total funds awarded were $136,000 and will help AMRI to become more financially independent.

Dr. Leszek Malkinski and clean room team.

New Faces at AMRI

Wizel Abdel-Fattah is the new undergraduate student worker helping out in the AMRI office. We welcome her bright attitude and hard work.

Mark Granier, a recent UNO Chemistry graduate, joins AMRI as a Research Associate cleaning for the renovation projects and assisting with waste removal in the AMRI laboratories.

AMRI Visitors

Professor Niel Crews, Director of IfM at LaTech visited AMRI to further discuss partnerships between IfM and AMRI (**June 1**).

Frank Buck, the Director of the Manufacturing Extension Partnership of Louisiana (MEPOL), toured the Institute as part of our efforts to strengthen ties with industry throughout Louisiana and to make manufacturing aware of AMRI's extensive synthesis, processing and analysis capabilities (**June 14**). For more information on MEPOL, please visit: http://mepol.org/about-mepol/.

Alan Neesley (Monsanto) and a group of high school teachers took toured AMRI (**June 21**). The teachers were at UNO participating in a week-long camp cosponsored by the National Academy of Corrosion Engineers (NACE) and American Society of Materials (ASM). For more information on NACE activities, please visit: https://www.nace.org/home.aspx.

Recent Publications

A. Maksymov, L. Spinu, "Static and Dynamic Properties of Three-Dimensional Dot-Type Magnonic Crystals," *Physica B-Condensed Matter*, 486, 177-182, Apr 1, 2016.

M.M. Dirtu, A.D. Naik, A. Rotaru, L. Spinu, D. Poelman, Garcia, "Fe-II Spin Transition Materials Including an Amino-Ester 1,2,4-Triazole Derivative, Operating at, below, and above Room Temperature," *Inorganic*

Chemistry 55 (9), 4278-4295, May 2, 2016. DOI: 10.1021/acs.inorgchem.6b00015

W. Lai, C. Abshire, H. Mandava, C. Carry, J. Liu, A. Gabrielson, M. Tarr, B. Lee, "Nanotechnology Combination Therapy for Renal Cell Carcinoma: Gold Nanorods Bound with Tyrosine Kinase Inhibitor Produces Synergistic Treatment Response When Combined with Laser Thermal Ablation in an Animal Model," *Journal of Urology*, 195 (4), E1125-E1125, Apr 2016.

J.A. Aguiar, S. Wozny, T.G. Holesinger, T. Aoki, M.K. Patel, M. Yang, J.J. Berry, M. Al-Jassim, W. Zhou, and K. Zhu, "In-situ Investigation on the Formation and Metastability of Formamidinium Lead Tri-iodide Perovskite Solar Cells," *Energy & Environmental Science*, 2016, DOI: 10.1039/C6EE01079B.

Recent Presentations

"Thermally-Induced Layer Compression in the Topochemically-Prepared $FeLa_2Ti_3O_{10}$ and Reductive Intercalation Products," Léa Gustin, Yoshiteru Hosaka, Tomoko Aharen, Cedric Tassel, Mark Granier, Yuichi Shimakawa, Hiroshi Kageyama and John B. Wiley, Materials Research Society, Phoenix, AZ, April 2016.

"Self-powered Broadband Photodetections Based on Piezo-phototronic Effect of II-VI Core/shell Nanowire Arrays" Weilie Zhou, The 2nd International Conference on Nanoenergy and Nanosystems, July 13-15, 2016 Beijing, China.

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