AMRI NEWSLETTER

Advanced Materials Research Institute

Volume 11, Issue 3 http://www.amri.uno.edu October 2013

2013 AMRI/Chemistry Summer Outreach Research Program

The 2013 AMRI Summer Outreach Program began on May 28 for undergraduate participants, and June 3 for high school student and teacher participants. This year there were 28 participants: 18 undergraduates, 2 high school teachers, and 8 high school students. Ten UNO faculty members from AMRI, Biological Sciences, Chemistry, and Physics acted as mentors: Drs. Matt Tarr, Gabriel Caruntu, Zhengchang Liu, Leszek Malkinski, Steven Rick, Leonard Spinu, Ed Stevens, Kevin Stokes, John Wiley, and Weilie Zhou.

Funding for this year's program was provided by the National Science Foundation (through: NSF-Research Experiences for Undergraduates, Awards No. DMR-1004869 and DMR-1262904; NSF-CAREER Award No. CHE-1157300, NSF Award CHE-1111525, and NSF Award ECCS-1028547); by the Louisiana Board of Regents [through: LA-EPSCoR RII Award No. NSF(2010-15)-RII-UNO (also known as LA-SiGMA)], NSF Award 1005856, and by the BP/The Gulf of Mexico Research Initiative.

During the summer program, the participants learned how to conduct research and worked on independent projects in chemistry, physics, biology, and/or materials science, as these fields relate to advanced materials, nanoscience, and nanotechnology. They worked in state-of-the-art laboratories, alongside experienced scientists (faculty, postdocs, and graduate students). In addition to their research activities, the participants attended weekly seminar programs which allowed for discussion of current scientific issues, general research concepts, and scientific ethics. During the course of the summer, our program participants also took part in a Meet-the-Faculty Pizza lunch, which gave them an opportunity to meet with professors and other researchers in an informal setting which acted as a vital mechanism for building relationships between the participants and faculty members. Such relationships provided key support to the program participants and dramatically strengthened their chances for success in scientific fields.

The conclusion of the 2013 AMRI Summer Outreach Program was July 26, 2013. On this day, participants took part in a Poster Session where they presented individual posters describing their projects and summarized the results they obtained. A celebratory cook-out lunch followed.

THE DIRECTOR'S CORNER

As we begin a new school year, 2013-2014, I want to take this opportunity to thank all of our researchers, collaborators, sponsors, and students for the continued interest and support of our research activities at AMRI. The past school year has been very productive and rewarding for all of us, and our summer research program was very successful. Our AMRI faculty is actively pursuing new sources of funding to continue and to expand the scope of our research in the areas of advanced materials and nanotechnology. We welcome the prospect of continuing our work and look forward to new and exciting developments to be realized during the new school year.

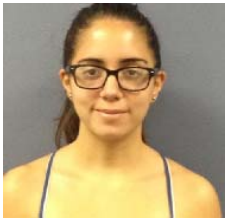
- - ***Leonard Spinu***

Poster Session: Emily Snyder and Dr. Leonard Spinu

Poster Session: Roshan Nepal and Nooraldeen Alkurd

Poster Session: Saul Schaffer, Dexter Taylor and Daniel Livingston

25th Anniversary HENAAC Conference



Andrea Natalia Martin, a 2013 AMRI REU Summer Research participant, was selected as a finalist for the 4th Annual Technical Papers & Posters Competition at the 25th Anniversary HENAAC Conference, to be held in New Orleans, from October 3-5, 2013.

Andrea will present a poster of her REU research on Development of Frequency Agile Devices Based on Stimuli-Active Magnetic Nanowire Composites. Dr. Leonard Spinu was her faculty mentor.

Annual REU LASIGMA Symposium

Ruqiao Alice Mao, a 2013 AMRI LASiGMA REU Summer Research participant, won third place on her REU poster presentation at the Annual LASiGMA REU Symposium on July 29, 2013 at the Marriott Hotel in Baton Rouge, LA.

Alice's poster was prepared from her summer research project on fabrication of Stimuli-Active Magnetic Nanowire Composites. Dr. Leonard Spinu was her faculty mentor.

AMRI Graduate Student Completes Doctorate

Congratulations are in order to AMRI Graduate tudent***, Shiva Adireddy***, who successfully completed his doctoral studies. Dr. Adireddy's dissertation title is "High Yield Solvothermal Synthesis of Hexaniobate Based Nanocomposites via the Capture of Preformed Nanoparticles in Scrolled Nanosheets."

Office of Research Awards

Congratulations are in order to ***Prof. Steve Rick*** on being a recipient of the 2013 University Research Professor award. Prof. Rick is in the Department of Chemistry, and is affiliated with AMRI as the Principal Investigator of the LA BoR LASiGMA research project.

New Faces

We welcome the following new additions to AMRI:

Prof. Dhruva Chakravorty joined the Department of Chemistry as an assistant professor, specializing in physical/computational chemistry, and AMRI as a co-PI in our LASiGMA research project. His area of research is in leveraging computational methods to investigate protein dynamics and enzymatic reactions for drug design.

Michael Shabetai joined AMRI as a Graduate Research Assistant following his completion of a B.S. in Chemistry from UNO. He will work in Dr. Weilie Zhou's lab on conductive polymer nano-fibers for VOC detection. He received a B.S. in Chemistry from the University of New Orleans and has worked for five years as an under-graduate research assistant in several AMRI labs.

Recent Publications

"High Yield Solvothermal Synthesis of Magnetic Peapod Nanocomposites via the Capture of Preformed Nanoparticles in Scrolled Nanosheets," Shiva Adireddy, Cecilia E. Carbo, Yuan Yao, Jose M. Vargas, Leonard Spinu, and John B. Wiley* *Chem. Mater.* **2013** (in press). http://dx.doi.org/10.1021/cm402352k

Andrei Diaconu, Catalin Martin, Jin Hu, Tijiang Liu, Bin Qian, Zhiqiang Mao, and Leonard Spinu, "Possible nodal superconducting gap in Fe1+y(Te1−xSex) single crystals from ultralow temperature penetration depth measurements", *Phys. Rev. B* **88**, 104502 (2013)

Recent Presentations

"Peapod nanocomposites: Directed capture of preformed nanoparticles in scrolled nanosheets," Shiva Adireddy, Cecilia E. Carbo, Yuan Yao, Jose M. Vargas, Leonard Spinu, and John B. Wiley, 246th ACS National Meeting, Indianapolis, IN, September 8-12, 2013 (talk).

"Topochemical manipulation of layered perovskites," M. Dariush Montasserasadi, Lea Gustin, Elisha A. Josepha, John B. Wiley, 246th ACS National Meeting, Indianapolis, IN, September 8-12, 2013 (talk).

"Multistep topochemical routes to new mixed-metal double-layered perovskites," Dariush M Montasserasadi and John B Wiley, 246th ACS National Meeting, Indianapolis, IN, September 8-12, 2013 (poster).

"Ultra-low temperature measurements of the in-plane penetration depth in Fe1+y(Te1-xSex) single crystals" Andrei Diaconu, Catalin Martin, Jin Hu, Tijiang Liu, Bin Qian, Zhiqiang Mao, and Leonard Spinu Poster Presentation at the Joint European Magnetic Symposia – JEMS 2013, Rhodos, Greece August 25-31, 2013

"Exchange Bias Coupling Strength in Static and Dynamic Experiments" Shankar Khanal, Andrei Diaconu, Jose M.

Vargas, Carlos Garcia, Caroline Ross, Leonard Spinu. Invited talk, IEEE ROMSC Workshop - 2013, Iasi, Romania, September 2-3, 2013\.

Other Achievements

Co-organizers of "Synthesis of Solid State Materials: Beyond 'Heat-and-Beat,'" were Prof. John B. Wiley (UNO) and Prof. Viktor Poltavets (Michigan State University) at 246th ACS National Meeting, Indianapolis, IN, September 8-12, 2013.

Dr. Narendra Babu, a former AMRI Postdoctoral Researcher, recently accepted an Assistant Professor position in the Department of Physics at the prestigious Osmania University in India.

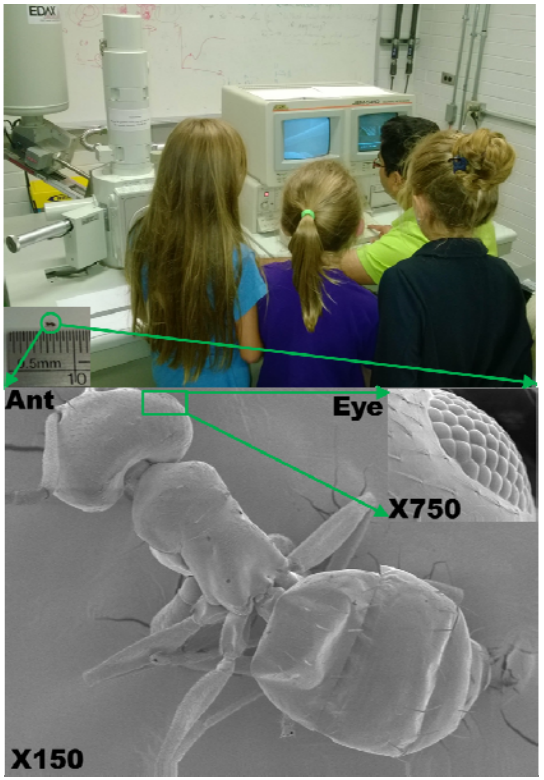
AMRI Faculty Participated in the Girl Scouts STEM Extravaganza at UNO. On Saturday, September 21, the AMRI faculty took part in the Girl Scouts Louisiana East S.T.E.M. Extravaganza which took place campus-wide at UNO. This event focused on creating a sense of enthusiasm and awareness among girls to inspire them towards STEM (STEM = Science, Technology, Engineering, and Math) careers. This event served to introduce girls to inspiring role models in scientific fields and engage them in STEM education, and to provide hands-on science experiments, technological advancements, and engineering marvels presented by experts in the fields. AMRI's contribution to this event was to provide a hands-on experience on "Materials Matter, Exploration of the properties of materials used in today's high technology devices." Approximately 3,000 participants, including the Girl Scouts and their families, were expected to have attended this event.

The following four photographs show several participants of the Girl Scouts STEM Extravaganza as they take part in AMRI's Materials Matter, Exploration.

Dr. Leszek Malkinski, Professor at AMRI, demonstrating the Barkhausen noise effect in magnets.

Girl Scouts of Southeast Louisiana STEM Extravaganza at UNO's AMRI Magnetism and Superconductivity Experiments Display.

AMRI graduate student Andrei Diaconu explaining magnetic levitation in liquid nitrogen cooled superconductors.



AMRI graduate student Satish Rai showing an electron microscope magnified image of an ant to girl scouts.

AMRI NEWSLETTER

- - a publication of the
Advanced Materials Research Institute,
College of Sciences,
University of New Orleans
New Orleans, LA 70148
Phone: (504) 280-6840 / Fax: (504) 280-3185
e-mail address: amri@uno.edu
Compiled by: Amanda Lamastus,
Lab Manager