Undergraduate Materials Research Initiative Funds 20 Projects, Announces 46 Honorable Mentions

Last fall, the Materials Research Society launched the Undergraduate Materials Research Initiative (UMRI) for which undergraduate students could apply for a $1,000 grant to support their materials-related projects. Beth Stadler of the University of Minnesota and chair of the MRS Academic Affairs Committee said that the committee wanted to offer an undergraduate-level award similar to that offered to graduate students, but that undergraduate students involved in research would be unlikely to travel to MRS Meetings. She said that then president of MRS Robert Nemanich (North Carolina State University) encouraged the committee to propose an award that teaches undergraduate students that MRS is all about materials research.

The committee designed a research funding program for fiscal year 1999 to introduce undergraduate students to the excitement of discovery through research in materials science and engineering. Under the program, each undergraduate awardee would receive a grant for the cost of a moderate research project of no more than $750 plus an additional award of $250 payable directly to each of the undergraduate researchers upon completion of the project.

Stadler, along with committee members Omar Manesreh (U.S. Air Force, New Mexico) and Susan Lord (University of San Diego), decided to make the process as educational as the research. They formatted a program announcement after typical announcements of U.S. government agencies which they then posted on the MRS website on November 1, 1998. Stadler said, "We required the same procedures as standard proposals, from description of ideas right down to institution signatures. It seemed like a lot of work for such small grants, so we were thrilled when 125 very high quality proposals were submitted in January 1999. The proposals were submitted by undergraduate researchers from 16 countries, and half of them were beyond a doubt worth funding. However, our budget only allowed the top 20 to be funded, so another 46 were given Honorable Mention."

MRS Past-President Nemanich said, "One of our goals last year was to emphasize activities which contribute to building a professional identity of MRS as a Society which we belong to throughout our careers. We implemented this Initiative to encourage undergraduates to become involved in materials research."

The grants were awarded in February. The final step for the grant recipients is to write a final report in the format of a professional article such as a proceedings, letter, or journal article. The students are encouraged to submit their reports to peer-reviewed journals.

On behalf of the Academic Affairs Committee, Stadler said, "We would like to thank everyone who submitted proposals and congratulate you on a job well done! These exceptional undergraduates, along with their advisors and institutions, are listed in this article."

Undergraduate Materials Research Initiative Grant Recipients

Crystal Bailey
Effects of Boundary Conditions on Simulated Molecular Beam Epitaxy Crystal Growth
University of Arkansas
Paul Thibado, Advisor

Michael Beam
Deposition of Tungsten Carbide Coatings for Tribological Applications Using Laser Ablation of Microparticles Method
University of Texas at Austin
Michael F. Becker, Advisor

Lisa Bishop
Low Temperature Magnet-Optical Kerr Effect Project
University of Colorado
Z. Celinski, Advisor

Pierre Bourque
Fractography of Tungsten and Platinum Wire under Single- and Multivariable Loading
Washington State University
M. Grant Norton, Advisor

Luis Cruz Rivera
Morphological Studies of Ni Foil Electrodes
Praire View A&M University
Thomas N. Fogarty, Advisor

Janet Cuy
Characterization of Tooth Enamel: Correlation in Structure, Chemistry, and Mechanical Properties
Johns Hopkins University
Timothy Weihs, Advisor

Ed Gozkowski, III
Single Crystal Growth of $Pb(Mg_{1/3}Nb_{2/3})O_3$-35 mol% $PbTiO_3$ (PMN-35 PT) from Polycrystal Precursors
Lehigh University
Martin Harmer, Advisor

Alison Jackson
Characterization of Grain Size and Composition Effects on the Imprint Behavior of Piezoelectric THUNDER Actuators
Clemson University
Robert W. Schwartz, Advisor

William Junek
Chemical Bath Deposition of Thin Film Photovoltaic Solar Cells
Florida Institute of Technology
Ryne Raffaelle, Advisor

Kasi Kiehlbaugh
Development of Chemical Reaction Mechanisms for Gas Phase Wafer Cleaning
University of Arizona
Anthony Muscat, Advisor

Donnacha Lowney
Sub-Gap Absorption Spectra and Physical Characterization of Semiconductor Materials Using Photoacoustic Spectroscopy and Synchrotron X-Ray Topography Techniques
Dublin City University
Patrick J. McNally, Advisor

Danielle Minnich
Synthesis, Characterization and Properties of PGA-co-PLA/PEO/PGA-co-PLA Tri-Block Copolymers: A Potential Drug Carrier
University of Akron
Stephanie Lopina, Advisor

Ben Pelletier
Artificial Aging of PMMA Bone Cement
University of California at Berkeley
Lisa Pruitt, Advisor

Joel Persson
Improving the Electrical Behavior of Ni-YSZ Cermet Anodes by Optimizing YSZ Particle Size and Particle Size Distribution for Use in Anode Supported Solid Oxide Fuel Cells (SOFCs)
University of Utah
Anil Virkar, Advisor

Heather Powell
Evolution of Porosity and Equilibrium Distribution of Common Fluids in Hydroxyapatite Aggregates: Application to Replacement Bone
Bowling Green State University
John R. Farver, Advisor

Claudia Ritter
Structural and Time-Resolved Scanning Probe Microscopy Study of Heterogeneous Amalgamated Systems on a Nanometer Scale
Humboldt University, Berlin
Klaus Rademann, Advisor

Erica Robertson
Growth of Diamond-Titanium Composite Films for Field Emission
North Carolina State University
Robert J. Nemanich, Advisor

Jens Schumacher
Epitaxial Growth of Oxides on Silicon
Johannes Gutenberg Univ. Mainz
Juan Carlos Martinez, Advisor

Per Slycke
Investigation of Imposed Layer-by-Layer Growth of Complex Oxide Thin Films with Pulsed Laser Deposition
University of Twente
Ir. D.H.A. Blank, Advisor

Kris Suthers
Temperature-Induced Fracture of Chert and Some Anthropological Applications
Oberlin College
Lynn Fisher, Advisor

Undergraduate Materials Research Initiative Honorable Mentions

Daniel Aubertine
The Structure of 2D Pt Clusters Studied with X-Ray Photoelectron Spectroscopy, Scanning Tunneling Microscopy, and Fourier Transform Infrared Spectroscopy Measurements of Adsorbed CO
Case Western Reserve University
Gary Chottiner, Advisor

Brant Blomberg
Simulation and Experimental Determination of Resistance Changes in Integrated Circuit Interconnects
University of Michigan
John Sanchez, Jr., Advisor

Eamon Briggs
Hall Measurements on Erbium- and Oxygen-Doped Silicon
Colby College
Shelby F. Nelson, Advisor

James Camp
Stabilizing Hyaluronic Acid Films through Chemical Crosslinking
University of Texas at Austin
Christine Schmidt, Advisor

Mary Chapman
New Second-Order Nonlinear Optical Materials via Crystal Engineering of Acentric Diamond-Type Metal-Organic Frameworks
Brandeis University
Wenbin Lin, Advisor

Adam Cohen
Redox Cycling and Molecular Conduction in Hg-SAM SAM-Hg Junctions
Harvard University
George Whitesides, Advisor

Brian Crozier
Adhesion Strength of Lead Zirconate Titanate (PZT) Thin Films Determined Using Nanoindentation
Washington State University
David F. Bahr, Advisor

Thomas Daniel
Testing a Surface Barrier Model to Describe the Luminescent Properties of Colloidal Semiconductors
Mercer University
Dale E. Moore, Advisor

Thomas Davidsmeier
Canted Dipolar Many Body Systems
Illinois Wesleyan University
Narendra Jaggi, Advisor

Matthew Davis
Preparation of AlN/TiN Solid Solution Via Pyrolysis of Mixed-Metal Organometallic Precursors
King's College
Frederick C. Sauls, Advisor

Filipa de Vasconcelos
Integration of Polymer Light-Emitting Diodes with Amorphous Silicon a-Si:H Thin Film Transistors for Large Area Display Applications
Instituto de Engenharia de Sistemas e Computadores (INESC), Portugal
Joao Pedro Conde, Advisor

Paul El-Diery
Electromigration
Lehigh University
G.S. Cargill III, Advisor

Luis Gardea
Magnetic Tape Micro Tensile Tester
University of the Pacific
Brian L.Weick, Advisor

Dayna Grajewski
Investigation of the Nucleation of Cadmium Telluride on Silicon
University of Illinois at Chicago
S. Sivananthan, Advisor

Massimo Groppi
Computer Simulation and TEM Analysis of Primary Crystallization in Amorphous Alloys
Università di Torino, Italy
Livio Battezzati, Advisor

April Hixson
Effect of Valence Cation Size on Fragile Glass Formation
Containerless Research, Inc.
Richard Weber, Advisor

Sharon Hogue
The Preparation of Novel Zeolite Films via Laser Ablation
University of Texas at Dallas
Kenneth J. Balkus, Jr., Advisor

Gregory Horvath
Construction of New Silver-Hydroxy Stilbazole-Indium Tin Oxide Photovoltaic Cell
Fordham University
John J. McMahon, Advisor

Kevin Hwang
Using Optics to Create a Better Colloidal Crystal
Rice University
Vicki Colvin, Advisor

Jennifer Lewis
Study of the Physical Properties of the Alkali Vanadate Glass System Related to Atomic Structure
Coe College
Steve Feller, Advisor

Christopher Love
Well-defined Monodisperse Polydimethylsiloxane-Functionalized Ruthenium (II) Tris (Bipyridine) Complexes with a Tunable Architecture for Oxygen Sensors
University of Virginia
Cassandra Frasier, Advisor

Olexander Lozovski
Optical Study of Polysaccharides
National Academy of Sciences of Ukraine
Ostap Getsko, Advisor

Vera Margaretha
Study on the Growth Mechanism of SnO_2 Thin Film Deposited by Chemical Vapor Deposition Method at Low Temperature
Bandung Institute of Technology, Indonesia
Wilson W. Wenas, Advisor

Kustov Maxim
Optical Study of Polysaccharides
National Academy of Sciences of Ukraine
Ostap Getsko, Advisor

Brian McAdams
Grain Growth and Orientation in Freestanding Aluminum Thin Films
Lehigh University
Richard P. Vinci, Advisor

Evan McCarney
An In Situ Study of the Biodegradation of Polyhydroxybutyrate Using Atomic Force Microscopy
James Madison University
Brian H. Augustine, Advisor

Melanie Morris
Molecularly Engineered Layered Materials
American University
Kelley J. Donaghy, Advisor

Christopher Murray
The Glass Transition in Freely Standing Polystyrene Films
University of Guelph, Canada
John Dutcher, Advisor

Michael Oye
Plasma Enhanced Chemical-Vapor Deposition of 1,3,5-tris (triflouromethyl) Benzene
University of California at Santa Barbara
Eray S. Aydil, Advisor

John Richardson
The Effect of Particle Proximity and Reactant Transport on the Rate of Reaction Between Calcium Hydroxide and Fly Ash from Coal Combustion
Tennessee Technological University
Joseph J. Biernacki, Advisor

Matteo Rinaldo
Excitons and Impurities in Semiconductor Heterostructures: A Study in Fractional-Dimensional Space
Worcester Polytechnic Institute
Lok C. Lew Yan Voon, Advisor

Steven Robertson
The Synthesis and Characterization of Anisotropic Gold Nanocrystals
Rice University
Vicki Colvin, Advisor

Jodie Rochemont
Bioactive Delivery Systems for the Slow Release of Antibiotics: Incorporation of Ag+ ions into the Nanoporous Titanium Oxide Coatings
Queen's University, Canada
M. Shirkhanzadeh, Advisor

Rachel Rosen
Fabrication and Characterization of Aligned Nanotube/Polymer Composites
University of North Carolina at Chapel Hill
Otto Zhou, Advisor

Leslie Sarikas
Pore Size Effects on the Flourescence Spectra of Sol-Gel Matrices
Wheaton College
Laura Muller, Advisor

Gregory Schmett
Synthesis and Studies of Red-Emitting Organic Electroluminescent Materials
University of Nevada, Las Vegas
Linda S. Sapochak, Advisor

Joshua Schmidt
Intercalation of the Layered Solid Acid $HCa_2NbTa_2O_{10}$ by Organic Amines
Reed College
Margret J. Geselbracht, Advisor

Agris Spiss
Recording of Holographic Optical Elements in Amorphous Semiconductor Photoresists
Institute of Solid State Physics, Latvia
Janis Teteris, Advisor

Jason Stauth
Hall Measurements on Erbium- and Oxygen-Doped Silicon
Colby College
Shelby F. Nelson, Advisor

Michele Sumstine
Investigation of In-doping of Cadmium Sulfide During Growth by Molecular Beam Epitaxy
University of Illinois at Chicago
S. Sivananthan, Advisor

Brian Tiberio
High Temperature Compression Creep Behavior of Ti_3SiC_2
Drexel University
Michael Barsoum, Advisor

Nancy Washton
Synthesis and Studies of Red-Emitting Organic Electroluminescent Materials
University of Nevada, Las Vegas
Linda S. Sapochak, Advisor

Simon Werner
Preparation of Collagen Dispersions
Widener University
Jerry Jaffia, Advisor

Fransisca Widyawardhani
Study on Factors Affecting the Luminescence Intensity and Efficiency of Light Emission in Erbium-Doped Silicon
Bandung Institute of Technology, Indonesia
Wilson W. Wenas, Advisor

David Wilson
Strength and Formation of Passive Films on Stainless Steel
Washington State University
David F. Bahr, Advisor

Angela Yuliana
Energy-Gap Calculation of Semiconductor Quantum Dots
Bandung Institute of Technology, Indonesia
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