

## Grants Awarded 2011

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### Doctoral New Investigator

#### Starter Grants Awarded to Faculty in Ph.-D.-Granting Departments

**Dr. Anastassia N. Alexandrova**, University of California, Los Angeles, Theory of Heterogeneous Oxidation of Carbon Monoxide by Sub-nano Surface-Deposits from Electronic Structure to Catalysis, \$100,000.

**Dr. Ivan Aprahamian**, Dartmouth College, Hydrazone-Based Rotary Switches as Proton-Relay Systems, \$100,000.

**Dr. Neil Ayres**, University of Cincinnati, *N*-Alkyl Urea Peptoid Oligomers as a New Type of Self-Assembling, Highly Versatile Soft Materials for Applications Involving Organogelators, \$100,000.

**Dr. Gary A. Baker**, University of Missouri-Columbia, Understanding Ionic Liquid Aided Graphene Production by Exfoliation of Graphite, \$100,000.

**Dr. Christopher J. Bettinger**, Carnegie Mellon University, Hydrolytic Activation of Shape-Memory Elastomers, \$100,000.

**Dr. Akram Boukai**, University of Michigan, Silicon Quantum Dot Superlattices for High Efficiency Thermoelectrics, \$100,000.

**Dr. Andrew J. Boydston**, University of Washington, Organocatalyzed Electroorganic Synthesis, \$100,000.

**Dr. Philip D. Bradford**, North Carolina State University, Investigation of a Novel Silicon/Carbon Nanotube 3-D Nanoarchitecture for Binder-Free, Stable Capacity, Lithium-Ion Battery Anodes, \$100,000.

**Dr. Jennifer R. Brown**, Montana State University, Non-Newtonian Fluid Dynamics in Porous Media Systems, \$100,000.

**Dr. Gong Chen**, The Pennsylvania State University, Catalytic Functionalization of Carbon-Hydrogen Bonds with Alkyl Halides, \$100,000.

**Dr. William R. Dichtel**, Cornell University, Bottom-Up Synthesis of Structurally Precise Graphene Nanoribbons, \$100,000.

**Dr. Aaron F. Diefendorf**, University of Cincinnati, Terrestrial Biomarker Transport Mechanisms and Implications for Interpreting Terrestrial Biomarker Signals in Oils and Bitumens, \$100,000.

**Dr. Gordana Dukovic**, University of Colorado at Boulder, Hybrid Inorganic-Organic Nanoscale Arrays: Structural Control and Mechanisms of Formation, \$100,000.

**Dr. Daniel H. Ess**, Brigham Young University, Quantum Mechanical Investigation of Fundamental Concepts in Hydrocarbon C-H Bond Activation, \$100,000.

**Dr. David A. Fike**, Washington University in St. Louis, Basin-Scale Chronostratigraphic Subsurface Correlation Using Isotopic Analysis of Well Cuttings and Cores, \$100,000.

**Dr. Michael J. Formolo**, University of Tulsa, The Control of Dissolved Organic Matter Compositions on the Production of Biogenic Methane in Unconventional Gas Reservoirs, \$100,000.

**Dr. Sophia Garashchuk**, University of South Carolina, Effects of Quantum Motion of Nuclei on Reactivity of Hydrocarbons Studied in the Approximate Quantum Trajectory Framework, \$100,000.

**Dr. Elizabeth A. Hajek**, The Pennsylvania State University, Fine-Sediment Storage and Bypass in Sandy Fluvial Systems, \$100,000.

**Dr. Thomas W. Hamann**, Michigan State University, Thin Film Absorber Solar Cells Using Earth Abundant Materials, \$100,000.

**Dr. Nilay Hazari**, Yale University, Palladium(I) and Nickel(I) Bridging Allyl Dimers for the Catalytic Functionalization of CO<sub>2</sub>, \$100,000.

**Dr. Marc A. Hesse**, The University of Texas at Austin, The Interpretation of Geochemical Patterns Through the Hyperbolic Theory for Reactive Transport in Porous Media, \$100,000.

**Dr. Simon M. Humphrey**, The University of Texas at Austin, New Hybrid Catalyst Materials: Confined Growth of Noble Metal Nanoparticles at Well-Defined Seed Points inside Phosphine Coordination Materials, \$100,000.

**Dr. Christopher S. Jeffrey**, University of Nevada, Reno, Design and Development of Heterocycloaddition Reactions of Aza-Oxyallylcationic Intermediates for Chemical Synthesis, \$100,000.

**Dr. Zhigang Jiang**, Georgia Institute of Technology, Novel Thermoelectric Material: Spin Seebeck Insulators, \$100,000.

**Dr. Kenneth L. Knappenberger**, Florida State University, Fundamental Antenna-Receiver Interactions in Metal-Based Light-Harvesting Nanostructures Studied by Magneto-Optical Spectroscopy, \$100,000.

**Dr. Isaac J. Krauss**, Brandeis University, Stereoselective Homoallylation of Aldehydes and Related Compounds, \$100,000.

**Dr. Amber T. Krummel**, Colorado State University, Investigating the Role Solute-Solvent Interactions in Asphaltene Nanoaggregation using 2D IR Spectroscopy, \$100,000.

**Dr. Laszlo Kurti**, The University of Texas Southwestern Medical Center at Dallas, Novel Catalytic Enantioselective [3,3]-Sigmatropic Rearrangements for the Preparation of Highly Substituted Fused Heterocycles and Biaryls, \$100,000.

**Dr. Catharine H. Larsen**, University of California, Riverside, Pyrrole-Based Organocatalysts for Chemical Rearrangements and Living Polymerizations, \$100,000.

**Dr. Daeyeon Lee**, University of Pennsylvania, Electric Field-Induced Interfacial Behavior of Janus Particles at an Oil-Water Interface, \$100,000.

**Dr. Jodie L. Lutkenhaus**, Texas A&M University, Curvature-Directed Crystallization of Polymer Dielectrics, \$100,000.

**Dr. Stephen Maldonado**, University of Michigan, Surface Enhanced Raman Spectroscopy of Group IV Semiconductor Electrodeposition and Deoxygenation, \$100,000.

**Dr. Jonathan A. Malen**, Carnegie Mellon University, Coupling of Electrons, Photons, and Vibrations in Hydrocarbon Based Molecular Junctions, \$100,000.

**Dr. Steven J. May**, Drexel University, Synthesis and Structure of Layered Perovskite-Zirconia Thin Film Interfaces: Model Systems for Fuel Cell Studies, \$100,000.

**Dr. Mathew M. Maye**, Syracuse University, Investigation of Hydrothermally Processed Nanomaterials for Integration with Third Generation Photovoltaics, \$100,000.

**Dr. Ying Shirley Meng**, University of California, San Diego, Functional Nanostructured Oxides for Electrochemical Energy Storage, \$100,000.

**Dr. Keith B. Neeves**, Colorado School of Mines, Measuring the Impact of Nanoscale Features on Oil and Gas Recovery, \$100,000.

**Dr. David A. Nicewicz**, University of North Carolina at Chapel Hill, Chiral Single Electron Oxidants as Catalysts for Cation Radical Reactions, \$100,000.

**Dr. Nitin Nitin**, University of California, Davis, Engineering Interfacial Properties of Emulsions to Limit Transport of Free Radicals and Oxygen Across the Interface, \$100,000.

**Dr. Susan A. Odom**, University of Kentucky, Robust Redox Shuttles for Overcharge Protection of Lithium Ion Batteries, \$100,000.

**Dr. Konrad Patkowski**, Auburn University, Accurate ab initio Studies of Hydrocarbon Physisorption on Carbon Nanotubes, \$100,000.

**Dr. W. James Pfaendtner**, University of Washington, Theoretical Considerations of Conjugated Polymer Self-Assembly, \$100,000.

**Dr. Scott T. Phillips**, The Pennsylvania State University, Synthesis of Depolymerizable Polymers, \$100,000.

**Dr. Sarah E. Reisman**, California Institute of Technology, The Development of Enantioselective Friedel-Crafts Reactions to Prepare Unnatural Amino Acid Derivatives, \$100,000.

**Dr. Joel Rosenthal**, University of Delaware, Electrocatalysts for the Proton-Coupled Electron Transfer Promoted Reduction of Carbon Dioxide, \$100,000.

**Dr. Sourav Saha**, Florida State University, Supramolecular Interactions of  $\pi$ -Acidic Naphthalenediimide Receptors with Anions, \$100,000.

**Dr. Jordan R. Schmidt**, University of Wisconsin-Madison, Bridging the Materials and Pressure Gaps in Rh-Catalyzed Syngas Conversion, \$100,000.

**Dr. Kyle T. Spikes**, The University of Texas at Austin, Rock-Physics and Seismic Modeling of the Haynesville Shale, \$100,000.

**Dr. Uttam K. Tambar**, The University of Texas Southwestern Medical Center at Dallas, Enantioselective Allylic Amination of Olefins, \$100,000.

**Dr. Christine M. Thomas**, Brandeis University, Synthesis of N-Heterocyclic Carbene-Dithiolate Pincer Ligands and their Transition Metal Complexes: Investigation of Reactivity and Ligand Redox Behavior, \$100,000.

**Dr. Samuel W. Thomas**, Tufts University, Enhanced Chromophore Stability Using Fluorescence Quenchers for Organic Photovoltaic Devices, \$100,000.

**Dr. Elisa Tomat**, University of Arizona, Prodigiosin-Based Platforms in Metalloradical Complexes for Dioxide Activation and Oxidative Catalysis, \$100,000.

**Dr. Aradhna K. Tripathi**, University of California, Los Angeles, Hot and Heavy or Cool and Fresh: Resolving Meteoric from Burial Diagenesis Using Clumped Isotopes, \$100,000.

**Dr. Nicolay V. Tsarevsky**, Southern Methodist University, Carboxylic Acids as Latent Initiators of Radical Polymerizations Mediated by Hypervalent Iodine Compounds: Synthesis of Functional Polymers and Unimolecular Micelles for Emulsification of Oils in Water, \$100,000.

**Dr. Anish Tuteja**, University of Michigan, Hygro-Responsive Surfaces: A New Approach for Oil-Water Emulsion Separation, \$100,000.

**Dr. Sam VanLaningham**, University of Alaska, Fairbanks, Tracking Yukon River Pathways to the Deep Ocean Over a Glacial-Interglacial Cycle, \$100,000.

**Dr. Jamie D. Walls**, University of Miami, Testing Models of Multi-Component Diffusion and Spin Relaxation in Porous Media under Radio Frequency Excitation in NMR, \$100,000.

**Dr. Donald A. Watson**, University of Delaware, Remote Directed Carbon-Hydrogen Activation using Bifunctional Catalysts, \$100,000.

**Dr. Arthur H. Winter**, Iowa State University, Theoretical and Experimental Investigation of Oxenium Ions, \$100,000.

**Dr. Matthieu Wyart**, New York University, Theoretical Study of the Rheology and Characteristic Length Scales of Granular Flows and Suspensions Based on an Analogy with the Plasticity of Glasses, \$100,000.

**Dr. Hao Xu**, Georgia State University, Catalytic Enantioselective Phenolic Oxidation by Cooperative Catalysis, \$100,000.

**Dr. Wei Zhang**, University of Colorado at Boulder, Development of Novel Facilitated Transport Membranes Consisting of Structure-Tunable Molecular Cages for Efficient Olefin/Paraffin Separation, \$100,000.

**Dr. Zhenrong Zhang**, Baylor University, Mechanism of Oxidative Dehydrogenation of Alkane on Supported Vanadium Oxide, \$100,000.

**Dr. Hui Zhao**, University of Nevada, Las Vegas, Studies of Streaming Potentials Generated by a Two-Phase Flow with Applications to Detecting Water Encroachment towards Oil Wells, \$100,000.  
**Dr. Zhaohui Zhong**, University of Michigan, Fundamental Investigation of Carrier Multiplication Processes in Carbon Nanomaterials, \$100,000.  
**Dr. Eva Dagmara Zurek**, University at Buffalo, State University of New York, The Role of the Support in MAO (Methylaluminoxane) Activated Olefin Polymerization, \$100,000.

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## **New Directions**

### **Awards for Fundamental Research**

**Dr. Paschalis Alexandridis**, University at Buffalo, State University of New York, Phase Behavior and Structure in Polymer/Lithium Salt Mixtures, \$100,000.  
**Dr. Travis S. Bailey**, Colorado State University, Block Copolymer Based Poly(RTIL)-RTIL Composite Membranes for CO<sub>2</sub> Separation and Sequestration, \$100,000.  
**Dr. Ronald K. Castellano**, University of Florida, The Selective and Sequential Chemistry of Electronically-Coupled Lactones, \$100,000.  
**Dr. Peng Chen**, Cornell University, Sub-Diffraction Imaging of Energy Conversion Reactions on Graphene, \$100,000.  
**Dr. Robert E. Continetti**, University of California, San Diego, Energetics and Dynamics of Biofuel Reactive Intermediates, \$100,000.  
**Dr. Paula L. Diaconescu**, University of California, Los Angeles, Non-Innocent Ligands as a Redox Switch for Copolymerization Reactions, \$100,000.  
**Dr. Tom G. Driver**, University of Illinois at Chicago, Synthesis and Design of New *N*-Heteroaromatic Materials, \$100,000.  
**Dr. Jeffrey R. Errington**, University at Buffalo, State University of New York, Understanding Interfacial Phenomena Related to Enhanced Oil Recovery, \$100,000.  
**Dr. Sergio Fagherazzi**, Boston University, Evolution of Mouth Bars and Salt Marshes in Deltas: Implications for Sedimentary Deposits and Stratigraphy, \$100,000.  
**Dr. Roland Faller**, University of California, Davis, Multiscale Modelling of the Interface of Model Crude Oils with Water, \$100,000.  
**Dr. Daniel E. Falvey**, University of Maryland, Photochemical Reduction of Carbon Dioxide using Organic Photocatalysts, \$100,000.  
**Dr. Patrick J. Farmer**, Baylor University, Photochemistry and Reactivity of Heterosubstituted Maltol Chelates, \$100,000.  
**Dr. Kenneth S. Feldman**, The Pennsylvania State University, Exploring Indolidene Chemistry: New Opportunities for Complex Indole Synthesis, \$100,000.  
**Dr. Joelle Frechette**, The Johns Hopkins University, Role of Drainage Channels on Lubrication Forces, \$100,000.  
**Dr. Julianne M. Gibbs-Davis**, University of Alberta, Correlating Molecular Environment with Performance in Immobilized Green Catalysts Using Nonlinear Optical Techniques, \$100,000.  
**Dr. Bing Gong**, University at Buffalo, State University of New York, Hydrogels Based on Dynamic Covalently Linking and Crosslinking, \$100,000.  
**Dr. Philippe Guyot-Sionnest**, University of Chicago, Electrochemistry, Surface Chemistry, and Luminescence of Single Fluorophore, \$100,000.  
**Dr. Juergen Hahn**, Texas A&M University, Dynamics and Control of Benzene Hydrogenation via Reactive Distillation, \$100,000.

**Dr. Arjun M. Heimsath**, Arizona State University, Dating Basin Deposits: Extending the Reach of Cosmogenic Nuclide Dating Into the Miocene, \$100,000.

**Dr. Carl D. Hoff**, University of Miami, Catalytic Carbonylation of Ketenes under Oscillating Pressures of Carbon Monoxide, \$100,000.

**Dr. Juske Horita**, Texas Tech University, Site-Specific Isotope Fractionation of Hydrocarbons by Quantitative NMR Spectroscopy, \$100,000.

**Dr. Yun Hang Hu**, Michigan Technological University, Synthesis and Characterization of Separated Graphene Sheets Without Substrates, \$100,000.

**Dr. Yongsong Huang**, Brown University, Re-Examination of Environmental Controls on Bacterial Branched Tetraether Lipids using North American Soils, \$100,000.

**Dr. Friederike C. Jentoft**, University of Oklahoma, Novel Mixed Metal Carbide Catalysts for Petroleum Processing, \$100,000.

**Dr. Jonathan I. Katz**, Washington University in St. Louis, Ultrasonic Studies of Jamming Transitions, \$100,000.

**Dr. Bruce E. Koel**, Princeton University, Toward Improved Heterogeneous Catalysts for Olefin Metathesis, \$100,000.

**Dr. Rouslan Krechetnikov**, University of California, Santa Barbara, Theoretical and Experimental Study of Dynamic Boundary Conditions at Surfactant-Laden Interfaces, \$100,000.

**Dr. Ilona Kretzschmar**, City University of New York, City College, Controlling the Partial Coalescence of Particle Stabilized Droplets, \$100,000.

**Dr. Masaru K. Kuno**, University of Notre Dame, Towards Spatially Resolved, Ultrafast Imaging of Individual Reduced Graphene Oxide Sheets, \$100,000.

**Dr. Jae W. Lee**, City University of New York, City College, Clathrate Hydrate Formation Behaviors in Amphiphilic Particle-Laden Interfaces, \$100,000.

**Dr. Salvatore D. Lepore**, Florida Atlantic University, Elucidation of Reactions Mediated by Sulfidic Carbonate and Clay Depositions: The Search for New Organic Reactions Mediated by Natural Materials, \$100,000.

**Dr. James P. Lewis**, West Virginia University, Exploring Electronic-Transfer Pathways of Hot Electrons in Organically-Assisted Metal Catalysts, \$100,000.

**Dr. Gaoming Li**, University of Tulsa, Accurate Hydraulic Fracture Characterization Using Microseismic and Production/Welltest Data, \$100,000.

**Dr. Christopher Y. Li**, Drexel University, Polymer Single Crystals for Nanocomposite Hydrogel, \$100,000.

**Dr. Wenzhi Li**, Florida International University, Synthesis and Characterization of Carbon Nanotube-Silicon Core-Shell Nanowire Array as Anode Material for Lithium-Ion Battery Application, \$100,000.

**Dr. Suljo Linic**, University of Michigan, From First Principles Studies to Novel Electro-Catalysts for Oxygen Reduction Reaction: Design, Synthesis and Testing, \$100,000.

**Dr. Cyrus K. Madnia**, University at Buffalo, State University of New York, Numerical Simulation and Modeling of Atomization of Hydrocarbons, \$100,000.

**Dr. Eric Masson**, Ohio University, Cucurbiturils in Organic Reactions: Encapsulation and Stabilization of Key Transient Species for Supramolecular Catalysis, \$100,000.

**Dr. Paul M. Mayer**, University of Ottawa, Ion-Molecule Chemistry of Bare Metal Anions, \$100,000.

**Dr. James M. Mayer**, University of Washington, The Role of Protons in Charge Transfer Reactions of Metal Oxide/Solution Interfaces, \$100,000.

**Dr. Matthew D. McCluskey**, Washington State University, Confocal Microscopy of Polymers under Pressure, \$100,000.

**Dr. Jennifer C. McIntosh**, University of Arizona, Compound-Specific Isotopes of Methanogenic Precursors in Coal: Laboratory, Field and Modeling Studies, \$100,000.

**Dr. Gautam Mitra**, University of Rochester, Fluid Flow Analysis in Fractured Rock using Structural Geometry and Geochemical Tracers (Noble Gas Isotopes and Trace Elements), \$100,000.

**Dr. Jorge A. Morales**, Texas Tech University, New Computational Methods to Accurately Predict Electronic Spin Resonance (ESR) Tensors and Their Applications to the Observed ESR Spectra of Petroleum Species, \$100,000.

**Dr. Jean-Francois Morin**, Universite Laval, New Strategies for the Preparation of Graphene Nanoribbons, \$100,000.

**Dr. Ashis Mukhopadhyay**, Wayne State University, Temperature-Tunable and Switchable Colloidal Interactions in Multi-Component Fluids, \$100,000.

**Dr. Teri W. Odom**, Northwestern University, Dynamic Trapping of Light with Tunable Liquid Metal Lattices, \$100,000.

**Dr. Nina Orlovskaya**, University of Central Florida, Super-Adiabatic Combustion in Porous Media with Catalytic Enhancement for Thermoelectric Power Conversion, \$100,000.

**Dr. Richard D. Pancost**, University of Bristol, Ni Isotopes as Novel Methanogenesis Tracers in Organic-rich Sediments, \$100,000.

**Dr. Ronald J. Phillips**, University of California, Davis, Vibration-Induced Stress and Surface Deformation in Bingham Fluids, \$100,000.

**Dr. David J. Pine**, New York University, Study of Surface Micelles Using Interfacial Force Microscopy, \$100,000.

**Dr. Michael C. Pope**, Texas A&M University, Sequence Stratigraphy, Detrital Zircon Geochronology, and Shale Geochemistry of Middle to Late Ordovician Quartzites in North America to Understand Provenance, Sediment Dispersal and Paleoclimate, \$100,000.

**Dr. Jeffrey Pyun**, University of Arizona, Novel Utilization of Elemental Sulfur for Nanocomposite Materials and Energy Storage, \$100,000.

**Dr. Raphael G. Raptis**, University of Puerto Rico, Rio Piedras Campus, Synthesis and Characterization of Dyads Capable of Achieving Photoexcited Two-Electron Charge-Separated States, \$100,000.

**Dr. Jennifer A. Roberts**, University of Kansas, Microbial Influence on Seal Integrity During CO<sub>2</sub> Injection, \$100,000.

**Dr. Reza Shahbazian Yassar**, Michigan Technological University, New Insights on High Performance Anodes for Lithium-Ion Batteries, \$100,000.

**Dr. Aleksey V. Smirnov**, Michigan Technological University, A Study of the Relationship Between Hydrocarbon Migration and Magnetic Alteration of the Michigan Basin Soils and Sediments: Towards Understanding the Magnetic Signature of Hydrocarbons, \$100,000.

**Dr. Jeremy M. Smith**, New Mexico State University, Electrocatalytic Water Oxidation by Manganese Pyridinophane Complexes, \$100,000.

**Dr. Xueyu Song**, Iowa State University, Reorganization Energy for Electron Transfer Reactions in Ionic Fluids, \$100,000.

**Dr. Francis W. Starr**, Wesleyan University, Dynamics of Ultra-Thin Polymer Films, \$100,000.

**Dr. Natalie Stingelin**, Imperial College London, Designing Novel Organic/Inorganic Hybrid Architectures for Efficient Energy Conversion, \$100,000.

**Dr. Kyle Strom**, University of Houston, Scaling of Deposition Rates and Deposits from Buoyant River Plumes, \$100,000.

**Dr. Mark S. Taylor**, University of Toronto, Self-Assembly of Catalysts and Ligands by Reversible Covalent Interactions of Organoboron Compounds, \$100,000.

**Dr. Philip L. Taylor**, Case Western Reserve University, Theoretically Guided Design of Efficient Polymer Dielectrics, \$100,000.

**Dr. Adam S. Veige**, University of Florida, A New Method to Link Metal Ions via Cycloaddition of Metal-Azides to Metal-Acetylides, \$100,000.

**Dr. Pengfei Wang**, University of Alabama at Birmingham, Photolabile Protecting Group-Based New Method for the Development of Photodegradable Polymers, \$100,000.

**Dr. Timothy H. Warren**, Georgetown University, Metal-Free Activation of Nitrogen Oxides for Hydrocarbon Functionalization, \$100,000.

**Dr. Sungsool Wi**, Virginia Polytechnic Institute and State University, Dynamic and Morphological Characterization of Reverse Osmosis Membranes, \$100,000.

**Dr. Alexandre F. T. Yokochi**, Oregon State University, Activation of Chemical Reactions Through Corona Discharge, \$100,000.

**Dr. Francis P. Zamborini**, University of Louisville, Electrochemically-Controlled Alkene Binding Affinity of Surface-Immobilized Metal-Thiolate Complexes, \$100,000.

**Dr. Liming Zhang**, University of California, Santa Barbara, Oximes as More Nucleophilic and Chiral Water, \$100,000.

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## Type SE

### ACS PRF Grants for Scientific Education

**Dr. Mary M. Kirchhoff**, American Chemical Society, 2011 Summer School on Green Chemistry and Sustainable Energy, \$100,000.

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## Undergraduate New Investigator

### Starter Grants Awarded to Faculty in Non-Ph.D.-Granting Departments

**Dr. Timothy J. Brunker**, Towson University, Investigation of the Stabilization of Boron-Containing Cations by Azametallocene Donors: Applications to Reduction, Hydroboration and Borylation Reactions, \$50,000.

**Dr. Bart J. Dahl**, University of Wisconsin-Eau Claire, The Design, Synthesis, and Characterization of 'Smart' Donor-Acceptor Biaryls, \$50,000.

**Dr. Adriana Dinescu**, Wilkes University, Biomimetic Catalysts for Hydrogen Production and Carbon Dioxide Activation, \$50,000.

**Dr. Gregory J. Domski**, Augustana College, Functionalized, Binuclear *N*-Heterocyclic Carbene Ligands Bearing Phosphine Donors: Synthesis of Metal Complexes and Applications to Homogeneous Catalysis, \$50,000.

**Dr. Christopher Goh**, Williams College, Utilizing Carboxylic Acids to Promote Rapid and Selective Iron Catalyzed Epoxidations of Alkenes, \$50,000.

**Dr. Stephanie L. Gould**, Austin College, Synthesis of New Tunable Porous Coordination Materials to Demonstrate Geared Motion in Solid-State Materials, \$50,000.

**Dr. Michael S. Hambourger**, Appalachian State University, Surface Immobilization of Cobalt-Diglyoxime Complexes: The Effects of Interfacial Chemistry on Electrocatalytic Activity in Aqueous Media, \$50,000.

**Dr. Fatemeh Hassanipour**, The University of Texas at Dallas, Enhanced Oil Recovery by Analysis and Control of Vortex Flow in Porous Media, \$50,000.

**Dr. Scott M. Johnston**, California Polytechnic State University, The Paleogeographic Origin of the Nacimiento Block, Central California Coast, \$50,000.

**Dr. Amy E. Keirstead**, University of New England, Using the Photo-Fries Reaction as a Photochemical Probe to Quantify the Cage Effects of Ionic Liquids, \$50,000.

**Dr. James P. Kercher**, Hiram College, Gas Phase Ion Dissociation Dynamics through Photoionization Mass Spectrometry, \$50,000.

**Dr. Jonathan T. Lyon**, Clayton State University, Insights into the Reaction Mechanism and Catalyst Efficiency of the Conversion of Alkanes to Fuel Alcohols and the Steam Reformation Process, \$50,000.

**Dr. Yuanbing Mao**, University of Texas-Pan American, Studies on the Synergistic Effects of Each Component of Hierarchical Ternary Nanocomposites for Lithium-Ion Battery Cathodes, \$50,000.

**Dr. Michael R. Marvel**, Aurora University, A Bond Valence-Mediated Approach to the Synthesis of Mixed Anion Inorganic Frameworks, \$50,000.

**Dr. Giovanni Meloni**, University of San Francisco, Synchrotron Photoionization Studies of Reaction Products and Intermediates of Biofuel Molecules Combustion, \$50,000.

**Dr. Kristine A. Nolin**, University of Richmond, Calcium Catalyzed Homologous Conjugate Addition Reactions, \$50,000.

**Dr. Adam J. Nolte**, Rose-Hulman Institute of Technology, Fundamental Studies of Swelling Hysteresis in Humidity Sensitive Polymer Films, \$50,000.

**Dr. Julie A. Pigza**, City University of New York, Queensborough Community College, Development of Oxyallyl Silanes as Homoenolate Equivalents in the Oxidative Addition to Vinylogous Amides, \$50,000.

**Dr. David A. Rider**, Western Washington University, Size and Shape Controlled Electrodeposition of Cuprous Oxide Semiconductor Nanoparticles from Tailored Diblock Copolymers Templates, \$50,000.

**Dr. Luyi Sun**, Texas State University-San Marcos, Epoxy Based Molecular Composites Containing Integrated Diamondoids, \$50,000.

**Dr. Alan E. van Giessen**, Hobart and William Smith Colleges, Determination of the Surface Free Energy for Curved Surfaces, \$50,000.

**Dr. Matthew T. Whited**, Carleton College, Ambiphilic Scaffolds for Cooperative Metal-Ligand Activation of Small Molecules, \$50,000.

**Dr. Yanjie Zhang**, James Madison University, Specific Ion Effects on the Interfacial Properties at the Hydrophobic/Aqueous Interfaces, \$50,000.

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## **Undergraduate Research**

### **Awarded to Faculty in Non-Ph.D.-Granting Departments**

**Dr. Paul A. Bonvallet**, The College of Wooster, Exploring the Controllable Uptake and Release of Pyridinium Ions with a Photoactive Calixarene-Capped Azobenzene, \$65,000.

**Dr. William J. Brittain**, Texas State University-San Marcos, Photochemical Control of Nanoparticle Aggregation, \$65,000.

**Dr. Richard D. Broene**, Bowdoin College, Ligands for the Cobalt-Catalyzed Dimerization of Alpha Olefins, \$65,000.

**Dr. Amy L.R. Bug**, Swarthmore College, Fundamental Simulations of Jamming in Confining Geometries: Effects from Surfaces, Obstacles and Exits, \$65,000.

**Dr. Peter J. Collings**, Swarthmore College, The Kinetics of Aggregating Dyes, \$65,000.

**Dr. Jason S. D'Acchioli**, University of Wisconsin-Stevens Point, Hydrogen Production via Homogeneous Catalysis: Investigations of the Water-Gas-Shift Reaction, \$65,000.

**Dr. Todd A. Davis**, Idaho State University, Utilizing Halogenated Carbonyls to Direct Stereoselective Synthesis, \$65,000.



**Dr. Mark A. Evans**, Central Connecticut State University, Fluid Evolution and Changes in Deformation Conditions During the Formation of the Central Appalachian Fold-and-Thrust Belt of Pennsylvania, \$65,000.

**Dr. Scott V. Franklin**, Rochester Institute of Technology, Geometrically Cohesive Granular Materials: Experiment and Simulation, \$65,000.

**Dr. Richard S. Herrick**, College of the Holy Cross, Fundamental Chemistry of the  $\text{Re}(\text{CO})_3(\text{H}_2\text{O})_3^+$  Synthon, \$65,000.

**Dr. Shouquan Huo**, East Carolina University, Control of Selectivity in Intramolecular Carbon-Hydrogen Bond Activations by Transition Metal Complexes, \$65,000.

**Dr. Stephanie K. Hurst**, Northern Arizona University, Polyaromatic Metal Complexes: Pathways to Graphene Sandwiches, \$65,000.

**Dr. Daniela Kohen**, Carleton College, Atomistic Simulations of Small Molecules' Behavior Within Al Substituted Zeolites, \$65,000.

**Dr. Harriet A. Lindsay**, Eastern Michigan University, Development of a Catalytic, Asymmetric Aza-Cope Rearrangement and Mannich Cyclization, \$65,000.

**Dr. Maria C. Milletti**, Eastern Michigan University, A Computational Exploration of the Stereoselective Synthesis of Substituted Pyrrolidines, \$65,000.

**Dr. Ram S. Mohan**, Illinois Wesleyan University, Applications of Iron(III) Compounds as Catalysts in Organic Synthesis, \$65,000.

**Dr. Carol A. Parish**, University of Richmond, Understanding Diradical Behavior in Asphaltene Model Compounds, \$65,000.

**Dr. David L. Patrick**, Western Washington University, Stamping Ordered Molecular Monolayers Using Liquid Crystal Inks, \$65,000.

**Dr. Steven J. Peters**, Illinois State University, Electron Driven Formation of Aromatic and Nonaromatic Substituted Isocyanurates and Isocyanuratocyclophanes from Isocyanates, \$65,000.

**Dr. Donald P. Poe**, University of Minnesota, Duluth, Fluid Flow and Solute Migration in Supercritical Fluid Chromatography, \$65,000.

**Dr. Michael R. Sandy**, University of Dayton, Brachiopod Shell Beds as Indicators and Predictors of Ancient Hydrocarbon Seeps: Assessing their Geological, Paleoecological, Evolutionary and Biostratigraphical Significance, \$65,000.

**Dr. Robert A. Stockland**, Bucknell University, Phosphorus-Hydrogen Activation Using Alkynylmetal Complexes: New Methodology for the Preparation of Metallopolymers, \$65,000.

**Dr. Christopher Wiebe**, University of Winnipeg, New Multiferroics Based on 2D Frustrated Sublattices, \$65,000.