

Grants Awarded 2013

Doctoral New Investigator

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

Dr. Casey Allen, Marquette University, High-Fidelity Iso-Octane Ignition Kinetics: New Rigor for an Unresolved Problem, \$100,000.

Dr. Georgios M. Bolas, University of Connecticut, Gasoline Selective Fischer-Tropsch Synthesis in Structured Catalytic Reactors, \$100,000.

Dr. Iman Borazjani, University at Buffalo, State University of New York, The Effects of Micro-Structure on the Rheology of Heavy Crude Oil, \$100,000.

Dr. Alexander S. Bradley, Washington University in St. Louis, Deconvolution of Sources of Isotopic Variability in Higher Plant Biomarkers, \$100,000.

Dr. Jeffery A. Byers, Boston College, Redox Robust Non-Noble Metal Catalysis, \$100,000.

Dr. Wesley A. Chalifoux, University of Nevada, Reno, Concise and Logical Bottom-Up Synthetic Approach to Structurally and Electronically Designed Graphene Nanoribbons, \$100,000.

Dr. Gordon F.B. Christopher, Texas Tech University, Role of Elastic Instabilities around Confined Cylinders on Excess Pressure Drop and Oil Displacement, \$100,000.

Dr. Bradley D. Cramer, University of Iowa, Resolving the Silurian Petroleum System on the Western Margin of the Appalachian Basin: Integrated High-Resolution $\delta^{13}\text{C}$, Conodont, and Chitinozoan Bio-Chemostratigraphy and the Continuing Search for the Source of Silurian-Hosted Hydrocarbon Resources, \$100,000.

Dr. Steven Crossley, University of Oklahoma, Naphthenic Acid Ketonization Mechanism over Zeolites, \$100,000.

Dr. Jillian L. Dempsey, University of North Carolina at Chapel Hill, Copper Photosensitizers for Photoredox Catalysis, \$100,000.

Dr. Justin P. Dodd, Northern Illinois University, Silicon Isotopes in Biogenic Silica as a Novel Proxy for Exploring Carbon Cycle Dynamics Throughout the Cenozoic, \$100,000.

Dr. Chuanhua Duan, Boston University, Effects of Nanoscale Confinement and Electrostatic Interactions on Molecular Conformation of Conjugated Polyelectrolytes, \$100,000.

Dr. Aaron P. Esser-Kahn, University of California, Irvine, Understanding Gas Reactivity at an Interface Using Petroleum Products, \$100,000.

Dr. Ryan C. Ewing, Texas A&M University, Testing Models of Dune Field Pattern Formation in Ancient Aeolian Stratigraphic Successions - Permian Cedar Mesa Sandstone, Utah and Jurassic Norphlet Sandstone, Gulf of Mexico, \$100,000.

Dr. Randy H. Ewoldt, University of Illinois at Urbana-Champaign, Identifying Molecular Structures of Polymers with Asymptotic Nonlinear Shear Rheology, \$100,000.

Dr. David W. Flaherty, University of Illinois at Urbana-Champaign, Separating the Effects of Location and Substituent Identity on the Acidity of Microporous Materials, \$100,000.

Dr. David J. Flannigan, University of Minnesota, Atomic-Scale Visualization of Paraffin Melting and Crystallization with Ultrafast Transmission Electron Microscopy, \$100,000.

Dr. Etienne Garand, University of Wisconsin-Madison, Spectroscopic Characterization of Pt(II) Catalytic C-H Activation Intermediates, \$100,000.

Dr. Sean Garrett-Roe, University of Pittsburgh, Ultrafast Vibrational Spectroscopy (2D-IR) of Ionic Liquids, \$100,000.

Dr. Fabien Goulay, West Virginia University, Experimental Investigations of Radical-Particle Reactions Relevant to Hydrocarbon Pyrolysis, \$100,000.

Dr. Lars Gundlach, University of Delaware, Catalytic Activity of Functionalized Graphene: Influence of Charge Carrier Dynamics, \$100,000.

Dr. Zoya Heidari, Texas A&M University, Impact of Organic-Matter Spatial Connectivity on Electrical Properties of Organic-Rich Source Rocks, \$100,000.

Dr. Jason C. Hicks, University of Notre Dame, Enhancing Oxidation Catalysis with Ti-Based Metal Organic Frameworks by Tuning Structure and Composition, \$100,000.

Dr. John A. Higgins, Princeton University, Magnesium Isotopes and the Origin of Marine Dolomite - New Insights into an Old Problem, \$100,000.

Dr. Christian Huber, Georgia Institute of Technology, Flow Response to Transient Forcing in Porous Media, \$100,000.

Dr. Kami L. Hull, University of Illinois at Urbana-Champaign, Development of a Titanium- or Zirconium-Oxo Catalyzed Alkyne-Aldehyde Coupling Reaction for the Synthesis of α,β -Unsaturated Carbonyls, \$100,000.

Dr. Mariano Iannuzzi, The University of Akron, Hydrogen Transport and Sulfide Stress Cracking of Nickel-Containing Low Alloy Steels for Sour Service, \$100,000.

Dr. Vlad M. Iluc, University of Notre Dame, Frustrated Metal-Ligand Interactions: C-H Activation and Functionalization, \$100,000.

Dr. Christine M. Isborn, University of California, Merced, Quantum Mechanical Calculations of Large-Scale Explicit Solvation, \$100,000.

Dr. Deb P. Jaisi, University of Delaware, An Isotopic Approach to Identify Biologically Mediated Smectite-Illite Reactions in Natural Environments, \$100,000.

Dr. John C. Jewett, University of Arizona, Fundamental Understanding of the Reaction To Generate Organic Diazo Compound from Azido-Organic Starting Materials, \$100,000.

Dr. Aditya S. Khair, Carnegie Mellon University, Nonlinear Oscillatory Diffuse Charge Dynamics, \$100,000.

Dr. Matthew K. Kiesewetter, University of Rhode Island, Electrostatically Tethered Catalysts for the Rate Acceleration of H-bond Mediated Transformations, \$100,000.

Dr. Brian M. Leonard, University of Wyoming, Synthesis of Nanostructured Multi-Metallic Carbide Materials for Inexpensive Catalysts and Catalyst Supports, \$100,000.

Dr. Jinjun Liu, University of Louisville, Spectroscopic Investigation of Vibronic Interactions in Molecules with Low Symmetry, \$100,000.

Dr. Tengfei Luo, University of Notre Dame, High Performance Thermal Diode Using Polyethylene Nanofibers, \$100,000.

Dr. Thomas J. Maimone, University of California, Berkeley, Cobalt-Catalyzed Carbon-Carbon Bond Forming Reactions of Simple Olefins, \$100,000.

Dr. Kevan B. Moffett, The University of Texas at Austin, Interactions of Fluvial Delta Island Aggradation with Organic Matter Deposition and Coastal Nutrient Export, \$100,000.

Dr. Pavel Nagorny, University of Michigan, Bronsted Acid-Catalyzed Reactions of Unsaturated Acetals, \$100,000.

Dr. SungWoo Nam, University of Illinois at Urbana-Champaign, Rapid-Thermal Catalytic Conversion of Petroleum Products into Multilayer Graphene, \$100,000.

Dr. Peter A. Nelson, Colorado State University, Modeling Stratigraphic Feedbacks in Fluvial Morphodynamics, \$100,000.

Dr. Zhihong Nie, University of Maryland, Phase Behavior of Giant Spherical Amphiphilic Block Copolymers in Solutions, \$100,000.

Dr. Alberto Passalacqua, Iowa State University, A Fundamental Investigation of Turbulence in Multiphase Gas-Particle Flows, \$100,000.

Dr. Michele Pavanello, Rutgers, The State University of New Jersey (Newark), Improving Hydrotreating by Tuning Energy Levels, \$100,000.

Dr. Christina M. Payne, University of Kentucky, Understanding the Molecular Mechanism of Biological Desulfurization to Improve Sulfur Removal from Petroleum, \$100,000.

Dr. Kimberly S. Petersen, University of North Carolina at Greensboro, Regio- and Enantioselective Trifluoromethylation Reactions through a Combined Directing Group/Chiral Trifluoromethylsilane Strategy, \$100,000.

Dr. Joshua G. Pierce, North Carolina State University, Thiohydroxamic Acids as Novel Reagents for the Construction of Heterocycles, \$100,000.

Dr. Jonathan K. Pokorski, Case Western Reserve University, Combinatorial Approaches for the Discovery of Stimulus-Responsive Supramolecular Gels, \$100,000.

Dr. Brian V. Popp, West Virginia University, Harnessing Zwitterions for Late-Transition-Metal Catalysis, \$100,000.

Dr. Brian W. Romans, Virginia Polytechnic Institute and State University, Detecting Signals of Sediment Supply in the Stratigraphic Architecture of an Outcropping Pleistocene Delta Complex, \$100,000.

Dr. Michael J. Rose, The University of Texas at Austin, Imparting Precious Metal Properties to First-Row Metals for C-H Activation: Ligation to Inexpensive, Heavy Main Group Donors, \$100,000.

Dr. Enrico Rossi, The College of William and Mary, Designer Graphene Nanostructures for Heterogeneous Catalysis, \$100,000.

Dr. Jonathan G. Rudick, State University of New York at Stony Brook, Synthesis of Multivalent and Multimodal Nanoparticles by 'Clicking-To' Multiblock Dendrimers, \$100,000.

Dr. Christopher C. Scarborough, Emory University, Electronically Responsive Ligands: Toward Two-Electron Reactivity with Earth-Abundant Transition Metals, \$100,000.

Dr. James D. Schiffbauer, University of Missouri-Columbia, Organic Carbon Preservation in Deep-Time: Exceptional Glimpses from Exceptionally-Preserved Fossils and Laboratory-Based Decay Experimentation, \$100,000.

Dr. Adam E. Smith, The University of Mississippi, A Fresh Perspective on Admicellar Polymerization: Determining the Effects of Deoxygenation, Monomer Partitioning, and RAFT Polymerization on Thin Film Formation, \$100,000.

Dr. Nathaniel K. Szymczak, University of Michigan, Design of Homogeneous Catalysts for Upgrading Alcohols, \$100,000.

Dr. Sindy K.Y. Tang, Stanford University, Two-Phase Flow in Constrictions, \$100,000.

Dr. Yuanzhi Tang, Georgia Institute of Technology, Assessing the Wettability Alteration of Carbonate Minerals at Nano-Scale, \$100,000.

Dr. Chia-Kuang (Frank) Tsung, Boston College, Selectivity Control of Heterogeneous Catalysis: Designing Selective Reaction Cavities on Well-Defined Metal Surfaces, \$100,000.

Dr. Jiandi Wan, Rochester Institute of Technology, Dynamics of the Dissolution of Carbon Dioxide (CO₂) Bubbles in Flow and the Formation of Clay-Covered CO₂ Emulsions, \$100,000.

Dr. Haifeng Wang, Purdue University, Study of Detailed Molecular Transport in Laminar Flamelet and Turbulent Non-Premixed Combustion, \$100,000.

Dr. Qiu Wang, Duke University, Facile Access to Vicinal Amino-Heteroatom Functionalities from N-X Bonds, \$100,000.

Dr. A. Joshua West, University of Southern California, Evaluating Li Isotope Preservation in Carbonates and Implications for Use of Li as a Carbon Cycle Paleoproxy, \$100,000.

Dr. Richard H. West, Northeastern University, Transition-State Prediction for High-Throughput Calculation of Accurate Chemical Reaction Rates, \$100,000.

Dr. Stephanie G. Wettstein, Montana State University, Effects of Mixture Adsorbates on Zeolite Unit Cell Dimensions, \$100,000.

Dr. Xifan Wu, Temple University, Signature of Molecular Environment in Spectroscopy Measurement of Water and Aqueous Solutions Studied by Advanced ab Initio Methods, \$100,000.

Dr. Ning Wu, Colorado School of Mines, Bi-Compartmental Targeting Vehicles for In-Situ Catalytic Recovery of Hydrocarbon Molecules, \$100,000.

Dr. Jianliang Xiao, University of Colorado at Boulder, Tunable Temperature-Responsive Surface Morphologies of Polymer Heterostructures, \$100,000.

Dr. Jian Zhang, University of Nebraska-Lincoln, New Strategies to Synthesize Covalent Organic Frameworks, \$100,000.

Dr. Jing Zhao, University of Connecticut, Probe Nanoscale Catalytic Sites with Surface-Enhanced Raman Scattering Using Core/Shell Nanoparticles, \$100,000.

New Directions

Awards for Fundamental Research

Dr. Jess F. Adkins, California Institute of Technology, A New High-Resolution Technique for Measuring Sulfur Isotopes in Carbonate Associated Sulfate: Stratigraphic Tests in Late Permian Platform Carbonates, \$100,000.

Dr. Aaron Aponick, University of Florida, The Development of a New Class of Atropisomeric Heteroaromatic Biaryl Ligands for Enantioselective Transformations, \$100,000.

Dr. Paulo E. Arratia, University of Pennsylvania, Investigating the Micro Structure and Rheology of Dense Colloidal Suspension under Shear Deformation, \$100,000.

Dr. Henry S. Ashbaugh, Tulane University, Thermodynamic Insights into Surfactant Assembly in Protic Ionic Liquids, \$100,000.

Dr. Jean-Philippe Avouac, California Institute of Technology, Investigating the Buffering Effect of an Active Piedmont in Routing Sediments to the Foreland, \$100,000.

Dr. Louis Barriault, University of Ottawa, Gold-Catalyzed Photoredox Transformations, \$100,000.

Dr. Eike B. Bauer, University of Missouri-St. Louis, A New Spectroscopic Method to Assess the Oxidative Capacity of Iron Complexes in Catalytic Oxidation Reactions, \$100,000.

Dr. Ilya N. Bindeman, University of Oregon, Stable Isotope Investigation of Organic Carbon-Bearing Precambrian Shales, \$100,000.

Dr. David L. Bryce, University of Ottawa, Solid-State NMR Studies of Heterometallic and Homometallic Organic Frameworks, \$100,000.

Dr. Shawn C. Burdette, Worcester Polytechnic Institute, Photo-Functional Switches and Metal Organic Frameworks Containing Azobenzene Groups, \$100,000.

Dr. Charles T. Campbell, University of Washington, Computing Entropies of Adsorbed Molecules, \$100,000.

Dr. Kevin A. Cavicchi, The University of Akron, Interfacial Free Radical Polymerization of Thin Films, \$100,000.

Dr. Renkun Chen, University of California, San Diego, Nanostructured Surfaces with Wetting Controllability for Dielectric Liquids for Phase Change Heat Transfer, \$100,000.

Dr. Chong Cheng, University at Buffalo, State University of New York, Well-Defined Polyrimings via Diyne-Functionalized Cyclic Monomers, \$100,000.

Dr. Ya-Huei (Cathy) Chin, University of Toronto, Structural Transition in Ru-Based Catalysts and Its Kinetic Consequences During Hydrodenitrogenation, \$100,000.

Dr. Russell J. Composto, University of Pennsylvania, Nanosphere and Nanorod Diffusion in Polymer Melts, \$100,000.

Dr. Juliet G. Crider, University of Washington, Carbonate Clumped-Isotope Paleothermometry to Track Structural Control on the Distribution of Warm and Cool Fluids in the Paradox Basin, Utah, \$100,000.

Dr. Cathleen M. Crudden, Queen's University, Boremium Catalysts for Metal-Free Enantioselective Reductions and Petasis Reactions, \$100,000.

Dr. Steven T. Cundiff, University of Colorado, Understanding the Role of Quantum Coherence in Molecular Energy Transfer Using Three-Dimensional Coherent Spectroscopy, \$100,000.

Dr. Joel D. Eaves, University of Colorado at Boulder, A Theoretical Study of Coherent Energy Transport in Polymers, \$100,000.

Dr. Sergei A. Egorov, University of Virginia, Functionalized Nanoparticles at Oil-Water Interface, \$100,000.

Dr. Christopher J. Ellison, The University of Texas at Austin, Supramolecular Gels and Nanocomposites with Multiple Stimuli Responsive Behavior, \$100,000.

Dr. Sarah J. Feakins, University of Southern California, Lignin to Lignite: The Potential of Methoxyl D/H Ratios to Discern Source Water and Diagenetic Exchange, \$100,000.

Dr. Rebecca M. Flowers, University of Colorado at Boulder, Quantitative Constraints on Thermal Histories in Carbonates and Marine Shales: Conodont (U-Th)/He Thermochronology, \$100,000.

Dr. Edward G. Gillan, University of Iowa, Photo-Thermal Catalysis of Methane Using Templated Macroporous Hybrid Metal Oxides, \$100,000.

Dr. Gregory S. Girolami, University of Illinois at Urbana-Champaign, Dinitrogen Reduction by Pincer Complexes of Early Transition Metals, \$100,000.

Dr. Rainer Glaser, University of Missouri-Columbia, Mechanistic Studies of Transition-Metal Catalyzed, MAO-Assisted Olefin Polymerization, \$100,000.

Dr. Mark S. Gordon, Iowa State University, Characterization of Nanodiamonds in Complex Environments, \$100,000.

Dr. Michael D. Graham, University of Wisconsin-Madison, Molecular Theory and Constitutive Models for Wormlike Micellar Solutions, \$100,000.

Dr. Thomas G. Gray, Case Western Reserve University, Rational Synthesis of Iridium(III)-Alkane Complexes, \$100,000.

Dr. Scott M. Grayson, Tulane University, The Modular Synthesis and Fundamental Properties of Hyperbranched Polymers Based on bis-MPA Monomers: Comparison with Dendrimers and Linear Analogs, \$100,000.

Dr. Ramakrishna Guda, Western Michigan University, Electron-Phonon Interactions in Atomically Monodispersed Gold Cluster/Graphene Oxide Nanocatalysts, \$100,000.

Dr. Zhanhu Guo, Lamar University, Multifunctional Desulfurization Elastomeric Polymer Nanocomposites, \$100,000.

Dr. Tobias Hanrath, Cornell University, Design, Processing, and Characterization of Advanced Binary Nanoparticle Catalysts, \$100,000.

Dr. Hendrik Heinz, The University of Akron, Understanding Nanoscale Calcium Silicate Hydrate (C-S-H) Interfaces in Cement and Interaction Mechanisms with Polymer Additives, \$100,000.

Dr. Robin G. Hicks, University of Victoria, Design, Synthesis and Properties of Functional Dyes Based on the Peri-Naphthindigo Template, \$100,000.

Dr. Pong-Yu (Peter) Huang, State University of New York at Binghamton, Contact Dynamics and Flow Blockage Inhibition of Armored Bubbles inside Confining Flow Conduits, \$100,000.

Dr. Derk Joester, Northwestern University, Atom Probe Tomography of Kerogen and the Kerogen-Mineral Interface, \$100,000.

Dr. Abraham Joy, The University of Akron, Elucidate the Molecular Origins of Mechanical Stress in Large Deformations of Polymer Glasses by Incorporating Chromophores into the Backbone as Molecular Probes, \$100,000.

Dr. David A. Kofke, University at Buffalo, State University of New York, A Comprehensive Molecular-Based Study of the Stability of Clathrate Hydrates, \$100,000.

Dr. Song-Chang Kong, Iowa State University, Characterizing Fuel Drop Vaporization at High-Pressure Environments, \$100,000.

Dr. Kevin J. Kubarych, University of Michigan, Ultrafast Surface-Specific 2D-IR Spectroscopy of Heterogeneous Interfaces and Mixtures, \$100,000.

Dr. Arshad A. Kudrolli, Clark University, Particle Sedimentation in Clay Suspensions, \$100,000.

Dr. Michael P. Lamb, California Institute of Technology, Reading River Response to Climate Change from River Terraces and Meander Dynamics, \$100,000.

Dr. Tristan H. Lambert, Columbia University, Organocatalytic Carbonyl-Olefin Metathesis and Olefin Metathesis, \$100,000.

Dr. Robert L. Leheny, The Johns Hopkins University, A Rheological Study of Interfacial Bacterial Films: Understanding the Mechanics of Two-Dimensional, Active Materials with Applications to Enhanced Oil Recovery, \$100,000.

Dr. Marsha I. Lester, University of Pennsylvania, Photochemistry and Unimolecular Dynamics of Criegee Intermediates, \$100,000.

Dr. Jennifer A. Love, University of British Columbia, Towards Pt-Catalyzed C-C Bond Formation of Hydrocarbons, \$100,000.

Dr. Katharine Maher, Stanford University, Development of U ($\delta^{235/238}$) Isotopes as a Tool for Reconstructing the Extent of Global Seawater Anoxia, \$100,000.

Dr. Christos T. Maravelias, University of Wisconsin-Madison, Methods for Closed-Loop Chemical Production Scheduling, \$100,000.

Dr. Gregory B. McKenna, Texas Tech University, Fingerprinting Non-Linear Response of Star-Branched and Dendritic Polymers: LAOS, Lissajous and Harmonics, \$100,000.

Dr. Michael V. Mirkin, City University of New York, Queens College, Dissolution of Pt Catalyst During Electroreduction of Oxygen, \$100,000.

Dr. Andrew M. Moran, University of North Carolina at Chapel Hill, Ultrafast Photochemical Reactions in Cyclic Monoalkenes, \$100,000.

Dr. Susan J. Muller, University of California, Berkeley, Transitions and Instabilities in Shear Banding Fluids, \$100,000.

Dr. Georgii I. Nikonov, Brock University, Well-Defined Zinc and Aluminum Catalysts for Reduction of Petroleum Derived Products, \$100,000.

Dr. Pavle V. Radovanovic, University of Waterloo, Defect-Mediated Manipulation of Excited-State Reactions at the Metal Oxide Surfaces in Solution, \$100,000.

Dr. Aldo Romero, West Virginia University, Designing Lithium Based Hard Materials from First Principles, \$100,000.

Dr. David Saintillan, University of Illinois at Urbana-Champaign, Nonlinear Electrohydrodynamics of Emulsions in Strong Electric Fields, \$100,000.

Dr. Jennifer M. Schomaker, University of Wisconsin-Madison, New Approaches to Alkene Functionalization via Dehydrogenative Metallation Catalyzed by First-Row Transition Metals, \$100,000.

Dr. Michael J. Serpe, University of Alberta, Investigating How Polymer Conformation Depends on Polymer Confinement between Surfaces and Its Effect on Surface-Surface Interactions, \$100,000.

Dr. Jared T. Shaw, University of California, Davis, Insertion Reactions of Diarylcarbenes for the Assembly of Complex Organic Molecules, \$100,000.

Dr. Nathan D. Sheldon, University of Michigan, The Role of Sea Level Change in the Spatial and Temporal Distribution of Organic Carbon Accumulation and Bottom Water Redox Conditions in the Cretaceous Niobrara Sea, \$100,000.

Dr. Jennifer S. Shumaker-Parry, University of Utah, Impact of Microenvironment on the Catalytic Activity of Supported Gold Nanoclusters, \$100,000.

Dr. Carsten Sievers, Georgia Institute of Technology, Reaction Pathways for Methane on Metal Oxide Surface - Influence of Lewis Acidity and Redox Activity, \$100,000.

Dr. Ivan I. Smalyukh, University of Colorado at Boulder, Structured Polymer Composites with Knotted Particles, \$100,000.

Dr. Todd M. Squires, University of California, Santa Barbara, Suspension Interactions via Gradients Generated in situ: Breaking Emulsions and Triggering Flocculation, \$100,000.

Dr. Brent S. Sumerlin, University of Florida, Accelerated Preparation of Polymer-Stabilized Catalytic Nanoparticles, \$100,000.

Dr. Andrew V. Teplyakov, University of Delaware, Control of the Catalytic Properties of Supported Nanostructures via Control of the Oxidation State of Transition Metals on Their Surfaces, \$100,000.

Dr. David R. Tyler, University of Oregon, Investigation of a Straightforward and Highly Customizable Synthetic Route to Triply Bidentate Phosphine Ligands, \$100,000.

Dr. Sachin Velankar, University of Pittsburgh, Buckling-Induced Morphological Transformations in Block Copolymers, \$100,000.

Dr. Bryan D. Vogt, The University of Akron, Nanostructured and Nanoporous Composites from Nanoparticle Jamming during Polymerization Induced Phase Separation, \$100,000.

Dr. Zhen-Gang Wang, California Institute of Technology, Effects of Ions on Interfacial Tension and Electrical Double Layer, \$100,000.

Dr. Xianqin Wang, New Jersey Institute of Technology, Synthesis and Characterization of a Novel and Entirely Green Hydrogenation Catalyst: Nitrogen Oligomer, \$100,000.

Dr. A. Alexander G. Webb, Louisiana State University, Exploring Salt Tectonics and Surface Processes, Kuqa Fold-Thrust Belt, Western China, \$100,000.

Dr. Josef P. Werne, University of Pittsburgh, The Compound-Specific Sulfur Isotopic Signature of Dissolved Organic Matter Sulfurization, \$100,000.

Dr. Nianqiang (Nick) Wu, West Virginia University, Metal-Organic Framework Catalyst for Organic Compound Conversion, \$100,000.

Dr. Ziling Ben Xue, The University of Tennessee, Studies of Magnetic Properties of Metalloporphyrins by Inelastic Neutron Scattering, \$100,000.

Dr. Xinghang Zhang, Texas A&M University, Stress Corrosion Cracking in Ultrafine Grained Ni and Its Alloy for Petrochemical Industries, \$100,000.

Dr. Kirk J. Ziegler, University of Florida, Nanofabrication of Porous Membranes for Separations of Gaseous Energy Carriers Under Conditions of Single-File Diffusion, \$100,000.

Undergraduate New Investigator Starter Grants Awarded to Faculty in Non-Ph.D.-Granting Departments

Dr. Mary Elizabeth Anderson, Hope College, Assembly and Characterization of Metal-Organic Coordinated Thin Films with Designed Catalytic Sites, \$50,000.

Dr. William E. Brenzovich, Roanoke College, Development of a Palladium-Catalyzed Oxidative Aryl Transfer Reaction, \$50,000.

Dr. Timothy L. Cook, Worcester State University, Controls on Organic Carbon Accumulation, Burial Efficiency, and Hydrocarbon Content in Lake Sediments of the Boreal Forest-Tundra Ecotone, Labrador, Canada, \$50,000.

Dr. Thomas C. Coombs, University of North Carolina at Wilmington, Synthesis and Cycloadditions of Alkyl-substituted Siloles and Exploration of Strained Bicyclic Silane Reactivity, \$50,000.

Dr. Andrew C. Crowther, Barnard College, Spectroscopic Study of Graphene Halogenation Dynamics in the Gas Phase and in Solution: New Two-Dimensional Materials for Catalysis, \$50,000.

Dr. Eric H. Fort, University of St. Thomas, Investigating the Mechanism of Aryl-Alkyne Cyclization of Azaborine Containing Aromatics, \$50,000.

Dr. John L. Haan, California State University, Fullerton, Elucidation of the Electronic Effect on Palladium-Based Catalysts for the Electro-Oxidation of Formate in Alkaline Media, \$50,000.

Dr. Rui He, University of Northern Iowa, Probing Phonons in Low-Dimensional Thermoelectric Materials by Raman Spectroscopy, \$50,000.

Dr. Christopher E. Hobbs, Angelo State University, The Use of Terminally-Functionalized, Atactic-Polypropylene Oligomers as Supports for Homogeneous Catalysis, \$50,000.

Dr. Helen M. Hoyt, Knox College, Preparation, Electronic Structure, and Reactivity Studies of Iron Complexes Supported by Conjugated α -Diimine Ligands, \$50,000.

Dr. Cindy Kan, Amherst College, Intramolecular Oxidopyrylium Ylide-Silyl Enol Ether [5C+2C] Cycloadditions, \$50,000.

Dr. Matthew F. Kirk, Kansas State University, Field Study of Fundamental Controls on Methane Formation in a Coalbed Methane Reservoir, \$50,000.

Dr. Kevin M. Miller, Murray State University, Structure-Activity Study of Triazolium-Containing Michael Addition Polyesters, \$50,000.

Dr. Karen S. Molek, University of West Florida, Extending the Applications of SALDI-MS for Asphaltene Analysis Using Transition Metal Oxide Nanopowders, \$50,000.

Dr. Amanda R. Murphy, Western Washington University, Tailoring the Chemical Structure of Conducting Polymers and Dopants To Enhance Electromechanical Actuation, \$50,000.

Dr. Abby R. O'Connor, The College of New Jersey, Synthesis of Cationic Nickel(II) Complexes Containing Hemilabile Groups for Use as Alkene Hydrogenation Catalysts, \$50,000.

Dr. Brandon P. Quillian, Armstrong Atlantic State University, Development of Homogeneous Ru(II) Olefin Hydroarylation Catalysts Supported by Oxy-Anionic Functionalized Bis(pyrazolyl)alkane Ligands, \$50,000.

Dr. Mahamud Subir, Ball State University, Surface Selective Laser Spectroscopy Investigation of Photochemistry of Aromatic Compounds at the Air-Water and Oil-Water Interface, \$50,000.

Dr. Rohan V. Tikekar, Drexel University, Engineering of Interfacial Barrier Properties to Reduce Oxidation in Emulsions, \$50,000.

Dr. Lisa M. Tranel, Illinois State University, Using Cosmogenic Nuclides to Evaluate Uplift and Erosion of the Guadalupe Mountains, New Mexico, \$50,000.

Dr. Jenny M. Baxter Vu, Valdosta State University, Synthesis of Highly Substituted Piperidines from Petrochemical Compounds, \$50,000.

Dr. David R. Weinberg, Colorado Mesa University, Chelation-Assisted Au(III) Functionalization of Strong, sp^3 -Hybridized C-H Bonds, Similar to Those Found in Alkanes, \$50,000.

Dr. Debing Zeng, Saint Peter's University, Mechanism of Multi-Spectral Infrared Imaging on Water-Oil Mixture, \$50,000.

Undergraduate Research

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

Dr. Paul W. Baures, Keene State College, Bottom Up Development of a Gas Hydrate Inhibitor Coating, \$65,000.

Dr. Bert D. Chandler, Trinity University, Monitoring Changes in Nanoparticle Electronics with Hammett Studies of Dendrimer Templated Supported Gold Catalysts, \$65,000.

Dr. Stephen A. Cooke, State University of New York, College at Purchase, The Characterization and Conformational Preferences of Long Alkyl Chains Using Advanced Broadband Microwave Spectroscopy, \$65,000.

Dr. James H. Davis, University of South Alabama, Synthesis and Thermophysical Behaviors of Mesothermal Liquid Salts, \$65,000.

Dr. H. J. Peterde Lijser, California State University, Fullerton, Mechanistic Studies of Radical and Radical Ion Intermediates in Oxidative Processes, \$65,000.

Dr. Jordan L. Fantini, Denison University, Development of Supramolecular Polymers Based on Novel Methylene-Bridge-Linked Multi-Calixarenes, \$65,000.

Dr. John D. Gilbertson, Western Washington University, Homogeneous Fischer-Tropsch Catalysts for the Conversion of Syngas into Higher Order Hydrocarbons, \$65,000.

Dr. Peter M. Graham, Saint Joseph's University, Synthesis and Reactivity of Molybdenum and Tungsten Carbon Dioxide Complexes, \$65,000.

Dr. Gretchen E. Hofmeister, Carleton College, Transition State Analogues as Mechanistic Probes for Asymmetric Desymmetrization by Cinchona Alkaloid-Based Catalysts, \$65,000.

Dr. Timothy J. Hubin, Southwestern Oklahoma State University, Novel Topologically Constrained Transition Metal Complex Oxidation Catalysts, \$65,000.

Dr. Kevin E. Johnson, Pacific University, Between Oil and Water: Computational Modeling of Molecular Structure and Interactions at Surfactant Modified Hydrophobic Interfaces, \$65,000.

Dr. Daniel J. Lehrmann, Trinity University, Assessing the Influence of Ocean Anoxia and Carbonate Saturation State on Carbonate Factory Distribution and Architecture of Carbonate Platforms: Permian-Triassic Nanpanjiang Basin, South China, \$65,000.

Dr. Jingbo L. Liu, Texas A&M University-Kingsville, Bringing Undergraduates Into Lab-Based Research and Development (BUILD) for Effective Shale Gas Storage Using Macroporous Adsorption Complexes (MACs), \$65,000.

Dr. Thomas G. Minehan, California State University, Northridge, Intramolecular Cycloaddition Reactions of Electron-Rich Alkynes: New Methods for the Synthesis of Optically Active Building Blocks for Organic Synthesis, \$65,000.

Dr. William H. Ojala, University of St. Thomas, Solid-State Chemistry of the Nitrile Oxides, \$65,000.

Dr. Christopher J. Pluhar, California State University, Fresno, Magnetostratigraphy of the Lodo Formation and Kinematics of the Vallecitos Syncline, California, \$65,000.

Dr. Alevtina L. Smirnova, South Dakota School of Mines and Technology, Supercritically Functionalized Nonstructures for Methane Reforming, \$65,000.

Dr. Sarah J. Schmidtke Sobeck, The College of Wooster, Impact of Solvent-Solute Interactions on Photochemistry of p-Aminobenzoic Acid Derivatives, \$65,000.

Dr. Jan Tobochnik, Kalamazoo College, Melting of Three Dimensional Colloidal Crystals, \$65,000.

Dr. Shanju Zhang, California Polytechnic State University, Surfactant-Induced Multiscale Assembly of Aqueous Conjugated Polymers, \$65,000.

Dr. Jake R. Zimmerman, Ohio Northern University, Investigation of a Stereoselective Tandem Inverse-Demand Hetero-Diels-Alder/Tin-Free Radical Process for the Synthesis of Highly Substituted Heterocycles, \$65,000.

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ACS PRF Grants for Scientific Education

Dr. Robert J. Hughes, American Chemical Society, 2013 ACS Scholars Program, \$50,000.

Dr. Robert J. Hughes, American Chemical Society, 2014-2018 ACS Scholars Program, \$250,000.

Dr. Mary M. Kirchoff, American Chemical Society, 2013 ACS Summer School on Green Chemistry and Sustainable Energy, \$100,000.

Dr. Mary M. Kirchoff, American Chemical Society, 2014-2018 ACS Summer School on Green Chemistry and Sustainable Energy, \$550,000.