



Grants Awarded 2017

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

- Dr. Vitaly Alexandrov**, University of Nebraska-Lincoln, Towards Atomistic Understanding of CO₂ Reduction to Fuels over Carbon-Based Metal-Free Electrocatalysts, \$110,000.
- Dr. Qi An**, University of Nevada, Reno, First Principles Multi-Scale Reactive Dynamics Modeling and Simulations to Predict Decomposition and Combustion of Clathrate Hydrates, \$110,000.
- Dr. Lauren E. Beckingham**, Auburn University, Understanding Fracture Permeability Evolution during Enhanced Oil Recovery (EOR), \$110,000.
- Dr. Tandis S. Bidgoli**, University of Kansas, Conodont Thermochronology: Expanding the Utility of the (U-Th)/He Method to Marine Carbonates and Shales, \$110,000.
- Dr. Prem Bikkina**, Oklahoma State University, Evaluation of Surface Wettability as a Parameter in Preferential Separation of Multi-Component Dissolved Gas Systems and Bubble Points of Pure Liquids, \$110,000.
- Dr. Jeanne L. Bolliger**, Oklahoma State University, Selective C-C Bond Formation Mediated by Modularly Assembled Catalysts, \$110,000.
- Dr. Juan J. Bravo-Suarez**, University of Kansas, In Situ and Operando Spectrokinetic Studies of Tungsten Based Catalysts for Olefin Metathesis, \$110,000.
- Dr. Leah B. Casabianca**, Clemson University, Theoretical and Experimental Study of the Aggregation Behavior of Model Asphaltenes, \$110,000.
- Dr. Qian Chen**, University of Illinois at Urbana-Champaign, Understanding Asphaltene Aggregation via Nanoscopic Dynamics Imaging, \$110,000.
- Dr. Roozbeh Dargazany**, Michigan State University, Early Failure of Elastomers: Understanding Damage Accumulation toward Failure, \$110,000.
- Dr. Prashant Deshlahra**, Tufts University, Kinetic and Theoretical Study of Vinyl Acetate Synthesis on Palladium Based Bimetallic Catalysts, \$110,000.
- Dr. Vikram V. Deshpande**, University of Utah, Experimental Realization of Organic Topological Insulators, \$110,000.
- Dr. Kunlun Ding**, Louisiana State University, Developing Self-Supported Metal Oxide Nanowire Catalysts for the Oxidative Coupling of Methane, \$110,000.
- Dr. Egor Dontsov**, University of Houston, Hydraulic Fracture in Anisotropic Elastic Material, \$110,000.
- Dr. Christopher Evans**, University of Illinois at Urbana-Champaign, Understanding Organic Liquid Separations in Polymerized Ionic Liquid Networks and Blends, \$110,000.
- Dr. Ken L. Ferrier**, Georgia Institute of Technology, Sensitivity of Sea Level to Sediment Erosion and Deposition in Massive Sedimentary Systems, \$110,000.
- Dr. Nagarjuna Gavvalapalli**, Georgetown University, π -Conjugated Polyelectrolyte Ionic Assemblies with Self-Chaperoning Bolaamphiphiles, \$110,000.
- Dr. M. Faruque Hasan**, Texas A&M University, Modular Process Intensification of Methane Separation, Storage and Conversion, \$110,000.
- Dr. Yongjie Hu**, University of California, Los Angeles, Heat Exchange Between Multi-Phases: Is There an Interface-Dominant Regime?, \$110,000.
- Dr. Robert M. Hughes**, East Carolina University, Expanding the Scope of Asymmetric Transformations Catalyzed by Promiscuous Biocatalysts in Non-Aqueous Media, \$110,000.
- Dr. Birendra Jha**, University of Southern California, Constitutive Modeling of Friction and Flow Properties of Faults during Multiphase Flow-Induced Seismicity, \$110,000.
- Dr. Christopher J. Johnson**, State University of New York at Stony Brook, Site-Specific Studies of CH Bond Activation on Metal Oxide Clusters, \$110,000.

Dr. Jonah W. Jurss, The University of Mississippi, Developing Durable and Highly Reactive Iron-Oxo Catalysts for Hydrocarbon Functionalization, \$110,000.

Dr. William E. Kaden, University of Central Florida, Development of Atomically-Planar, Well-Ordered Molybdenum-Nitride Thin-Films for Phase-Specific Hydrodenitrogenation Surface-Science Model-Catalysis Studies, \$110,000.

Dr. Julia Kalow, Northwestern University, Visible Light-Promoted Functionalization of Coal-Tar Dyes: Mechanism and Synthetic Utility, \$110,000.

Dr. Rennie B. Kaunda, Colorado School of Mines, Hybrid Numerical Simulations of Microstructure Effects and Stress State during Hydraulic Fracture Propagation, \$110,000.

Dr. Chenfeng Ke, Dartmouth College, Hydrogen Bond Directed Synthesis of Covalent Organic Framework Materials, \$110,000.

Dr. Peter Kekenes-Huskey, University of Kentucky, Multi-Scale Modeling of Methane Permeation in Defect-Containing Zeolitic Materials, \$110,000.

Dr. Jennifer E. Laaser, University of Pittsburgh, "Click" Polyelectrolytes for Rapid Exploration and Control of Complex Polymer Phase Behavior, \$110,000.

Dr. David C. Lacy, University at Buffalo, State University of New York, Photodehydrogenative Coupling of Aromatic Hydrocarbons with a Manganese Catalyst, \$110,000.

Dr. Jianing Li, University of Vermont, An Integrated Multiscale Approach to Simulate Amorphous Porous Polymer Networks, \$110,000.

Dr. Peilin Liao, Purdue University, Computational Modeling of High Temperature Water-Gas Shift Reaction over Iron Oxide Catalysts, \$110,000.

Dr. Guoliang Liu, Virginia Polytechnic Institute and State University, Controlling the Pore Size and Orientation in Block Copolymer Fibers and the Corresponding Porous Carbon Fibers, \$110,000.

Dr. Jorge Lorenzo-Trueba, Montclair State University, Exploring the Role of Organic Sediment Dynamics on Channel Clustering and Alluvial Architecture, \$110,000.

Dr. Gabriel Menard, University of California, Santa Barbara, Investigating the Proposed Reduction-Coupled Oxo Activation Mechanism for Hydrocarbon C-H Functionalization, \$110,000.

Dr. Sharon R. Neufeldt, Montana State University, Converting Methane to Higher Alkanes via Boron Homologation with Metal Methylidenes, \$110,000.

Dr. Rui Ni, The Pennsylvania State University, Pore-Scale Visualization of Clogging and Unclogging Dynamics in Saturated Porous Medium, \$110,000.

Dr. Edmund F. Palermo, Rensselaer Polytechnic Institute, Synthesis of Advanced Functional Self-Immolative Polymers, \$110,000.

Dr. Michelle L. Personick, Wesleyan University, Tailored Bimetallic Catalysts with Highly Stepped Facets for Selective and Energy-Efficient Epoxidation and Hydrogenation Reactions, \$110,000.

Dr. Valentina Prigiobbe, Stevens Institute of Technology, Measuring and Modeling the Behavior of a Nanoparticle-Stabilized CO₂-Foam in Porous Media, \$110,000.

Dr. Sergey Pronin, University of California, Irvine, Development of Cobalt(I)-Catalyzed Radical-Polar Crossover Reactions, \$110,000.

Dr. Srinivas Rangarajan, Lehigh University, Computational Investigation of Alkane Dehydrogenation Chemistry on Transition Metal Sulfides for Olefin Production from Shale Gas Derived Alkanes, \$110,000.

Dr. Brandi Kiel Reese, Texas A&M University-Corpus Christi, Linking Methane Production to Methanogenic Gene Expression, \$110,000.

Dr. Aaron J. Rossini, Iowa State University, Probing Secondary Bonding Interactions in Organometallic Complexes by Measurement and Prediction of Metal-Hydrogen NMR Scalar Coupling Constants, \$110,000.

Dr. Bryce Sadtler, Washington University in St. Louis, Identification of Active Sites in Methane Oxidation Catalysts by Single-Molecule Fluorescence Imaging, \$110,000.

Dr. Andre Schleife, University of Illinois at Urbana-Champaign, High-Temperature Corrosion Resistance from First Principles, \$110,000.

Dr. Nathan D. Schley, Vanderbilt University, Iridium Allyl Intermediates in the Formation and Cleavage of Ether C-O Bonds, \$110,000.

Dr. Julio Sepulveda, University of Colorado at Boulder, Assessing the Role of Nitrogen Cycling on Black Shale Formation, \$110,000.

Dr. Indrajeet Sharma, University of Oklahoma, Synthetic Utility of Cascade Reactions Involving Diazo Synthons, \$110,000.

Dr. John B. Shaw, University of Arkansas, Investigating Advective and Diffusive Controls on Fine-Grained Sediment Transport and Deposition, \$110,000.

Dr. Jacob T. Shelley, Rensselaer Polytechnic Institute, Characterization of a Solution-Cathode Glow Discharge Source for Ionization, Tunable Fragmentation, and Rapid Identification of Molecules and Polymers with Mass Spectrometry, \$110,000.

Dr. Xingyong Song, Texas A&M University, Modeling and Control of Large-Scale String Dynamics for Unconventional Oil & Gas Production, \$110,000.

Dr. Daniel Stolper, University of California, Berkeley, Experimental Determination of C-H Bond Isotope-Exchange Kinetics for Singly and Multiply Substituted Methane Isotopologues, \$110,000.

Dr. Justin Vincent Strauss, Dartmouth College, Neoproterozoic Analogs for Mg-Silicate-Bearing Petroleum Basins, \$110,000.

Dr. Daniel M. Sturmer, University of Cincinnati, Is Railroad Valley an Anomaly? Using Mountain Geomorphology and Basin Stratigraphy to Identify Buried Mega-Landslides, \$110,000.

Dr. Gopinath Subramanian, The University of Southern Mississippi, Damage Accumulation in Elastomers: A Multiscale Approach, \$110,000.

Dr. Michal Szostak, Rutgers, The State University of New Jersey (Newark), Asymmetric C-C Bond Construction Utilizing Organoboron Reagents via Cooperative Catalysis for the Synthesis of Chiral Amines from Petrochemical Feedstock, \$110,000.

Dr. Andrew R. Teixeira, Worcester Polytechnic Institute, Enhanced Zeolite Synthesis/Mechanism Assessment by Dynamically-Controlled Microcrystallization, \$110,000.

Dr. Zhiting Tian, Virginia Polytechnic Institute and State University, Asymmetric Thermal Properties of a Novel Polymer Topology, \$110,000.

Dr. Katharine Moore Tibbetts, Virginia Commonwealth University, Pulsed Laser Ablation Surface-Mediated Excitation and Reduction (PLASMER) as a One-Step Route to Nanostructured Metal-Oxide Composite Catalysts, \$110,000.

Dr. Rong Tong, Virginia Polytechnic Institute and State University, Stereoselective Polymerization of Petroleum-Derived *O*-Carboxyanhydride, \$110,000.

Dr. Georgios Tsilomelekis, Rutgers, The State University of New Jersey, Developing Novel Mixed Metal Oxides as Stable Solid Super Acids for Alkylation Reactions, \$110,000.

Dr. Gael Ung, University of Connecticut, Low-Valent Divalent Lanthanide Complexes for Alkane Activation, \$110,000.

Dr. David S. Vinson, University of North Carolina at Charlotte, Concurrent Utilization of Methane Precursors: Implications for Biogenic Coalbed Methane, \$110,000.

Dr. Muzhou Wang, Northwestern University, Optimal Processing of Self-Assembled Block Copolymers Using Super-Resolution Optical Microscopy, \$110,000.

Dr. Lee-Ping Wang, University of California, Davis, Computational Design of Deep Eutectic Solvents for Natural Gas Sweetening Applications, \$110,000.

Dr. Christopher Wirth, Cleveland State University, Microstructure and Transport of Nanoparticle Laden Foams in Porous Media, \$110,000.

Dr. Xinyu Zhao, University of Connecticut, A Computational Study of the Lean Blow-Off Mechanisms for a Bluff-Body Stabilized Premixed Flame, \$110,000.

Dr. Mingjiang Zhong, Yale University, Development of Isotactic Controlled Radical Polymerization Using Rationally Designed Lewis Acids, \$110,000.

New Directions

Awards for Fundamental Research

Dr. Julio C. Alvarez, Virginia Commonwealth University, Mechanistic Investigation of the Water-Organic Interface in Aqueous Emulsion Micro-droplets as a Model to Understand "On-Water Catalysis" in Heterogeneous Water-Organic Systems, \$110,000.

Dr. Cornelia Bohne, University of Victoria, Comparison of the Mobility of Small Molecules in Molecular and Polymer Hydrogels, \$110,000.

Dr. Eric Borguet, Temple University, Investigating Complex Solid-Liquid Interfaces Using the Vibrational Spectroscopy and Dynamics of Molecular Ions, \$110,000.

Dr. David A. Budd, University of Colorado at Boulder, Evolution of Nanopore Networks in Unconventional Chalk-Rich Reservoirs: Integrating the Effects of Catagenesis with Mineral Diagenesis, \$110,000.

Dr. Alejandro Bugarin, The University of Texas at Arlington, Development of Unique Functional Group Interconversions, \$110,000.

Dr. Walter G. Chapman, Rice University, Effects of Nano-Pore Confinement on Fluids in Organic Shale Using NMR Measurements and MD Simulations, \$110,000.

Dr. Jianjun Cheng, University of Illinois at Urbana-Champaign, Highly Efficient Macrocyclic Formation from Petrochemicals Isocyanates and Hindered Amines, \$110,000.

Dr. Jacinta C. Conrad, University of Houston, Enhancing pH-Response of Polyelectrolyte Brushes via Tunable Dispersity, \$110,000.

Dr. Christopher C. Cummins, Massachusetts Institute of Technology, Nickel and Cobalt Ethylene Polymerization Catalysts Supported by Novel Macrocyclic Phosphine Ligands, \$110,000.

Dr. Mark R. DeGuire, Case Western Reserve University, Chemical Expansivity in Ceramic Oxygen Transport Materials, \$110,000.

Dr. Cristiano Luis Dias, New Jersey Institute of Technology, Role of Methanol in Methane Clathrate Formation, \$110,000.

Dr. Linda H. Doerrer, Boston University, Lanthanide-Based Polymerization Catalysts with Water Resistant Ligands, \$110,000.

Dr. Jiye Fang, State University of New York at Binghamton, Ceria Facet-Dependent Oxidative Coupling of Methane towards C₂ Products, \$110,000.

Dr. Katherine J. Franz, Duke University, Mapping Mechanically Activated Pathways of Metal Coordination Complexes, \$110,000.

Dr. Joelle Frechette, The Johns Hopkins University, Friction in Saturated Porous Media, \$110,000.

Dr. Alison J. Frontier, University of Rochester, Building Complex Polycycles Using a "Carbonyl Pinch" Strategy, \$110,000.

Dr. James R. Gardinier, Marquette University, C-H and C=C Bond Functionalization with Silver(I) Formamidates, \$110,000.

Dr. Benjamin C. Gill, Virginia Polytechnic Institute and State University, Investigation of Sulfur Transformations Associated with Magma Emplacement in Organic-Rich Sedimentary Rocks, \$110,000.

Dr. Bing Gong, University at Buffalo, State University of New York, Two-Dimensional Oligomers and Polymers: Design and Template-Free Synthesis, \$110,000.

Dr. Harry B. Gray, California Institute of Technology, Electrocatalytic C-H Functionalization of Hydrocarbons, \$110,000.

Dr. Huixin He, Rutgers, The State University of New Jersey (Newark), Improving Dehydrogenation via Anionic Tuning of the Electronic Structures of Transition Metal Compounds, \$110,000.

Dr. Marc A. Hesse, The University of Texas at Austin, Two-Phase Flow and Episodic Pore Fluid Migration through Rock Salt: Control on Sub-Salt Pressure and Seal Capacity, \$110,000.

Dr. Francisco R. Hung, Northeastern University, Understanding Novel Shale Hydration Inhibitors for Water-Based Drilling Fluids Using Molecular Simulation, \$110,000.

Dr. Hadi Jabbari, The University of North Dakota, A New Approach to Quantifying Adsorption/Diffusion Characteristics of Shale Formations, \$110,000.

Dr. Cari L. Johnson, University of Utah, Common Minerals and Common Pb Isotopes: Uncommon Applications and New Method Development for Detrital K-Feldspar Provenance Analysis, \$110,000.

Dr. Susan M. Kidwell, University of Chicago, Persistence of Shell Carbonate and Paleo-Environmental Information under Challenging Conditions: Time-Averaging and Aragonite Stabilization in Modern Cold-Water Seabeds, \$110,000.

Dr. Arun K. Kota, Colorado State University, Understanding the Influence of Contact Angle Hysteresis on Pressure Drop and Heat Transfer Coefficient in Single Phase Flow, \$110,000.

Dr. Satish Kumar, University of Minnesota, A Rigorous Theoretical Framework for the Spreading of Liquid Droplets on Soft Solid Substrates, \$110,000.

Dr. Bruce M. Law, Kansas State University, Coupled Brownian Motion at Liquid-Air Surfaces, \$110,000.

Dr. Nicholas E. Leadbeater, University of Connecticut, Sulfur and Selenium Monoxide Transfer Reagents, \$110,000.

Dr. Daeyeon Lee, University of Pennsylvania, Homogeneously Catalyzed Biphasic Reactions Enabled by BIJELs, \$110,000.

Dr. Ying Li, Texas A&M University, Heteroatom-Doped Porous Carbon Derived from Petroleum Coke for Electrocatalytic Conversion of Carbon Dioxide to Fuels, \$110,000.

Dr. Matthew W. Liberatore, University of Toledo, Altering Wax Appearance Using Shear and Pressure, \$110,000.

Dr. Zhiqun Lin, Georgia Institute of Technology, Rational Design and Synthesis of Well-Defined Organic Linear and Janus-Type Molecular Bottlebrush Cocoon As Well As Star-like Molecular Bottlebrush Trilobes, \$110,000.

Dr. Richard A. Loomis, Washington University in St. Louis, Characterization of Reaction Dynamics and Interactions Using a Bottom-up Approach, \$110,000.

Dr. Paul A. Maggard, North Carolina State University, Investigation of Liquid-Alloy Based Growth of Alumina Aerogels, \$110,000.

Dr. J. Will Medlin, University of Colorado at Boulder, Use of Organic Monolayers to Tune the Surface Properties of Zeolites for Enhanced Separations, \$110,000.

Dr. Giovannantonio Natale, University of Calgary, Multiscale Modeling in Drilling Fluids: Interactions between Cuttings and Nanoscale Particles, \$110,000.

Dr. Aaron L. Odum, Michigan State University, Iron-Based Catalysts for Asymmetric Hydrogenations Containing Planar Chirality, \$110,000.

Dr. Dimitrios V. Papavassiliou, University of Oklahoma, Stability of Surfactant Systems for Oil Mobilization, \$110,000.

Dr. Lilo Danielle Pozzo, University of Washington, In Situ Small Angle Scattering Analysis of Ultrasound Excitation of Emulsion Droplets, \$110,000.

Dr. Eugene C. Rankey, University of Kansas, Redox-Sensitive Chemical Elements of Upwelling Ramp Systems: A Comparative Study of Modern and Ancient Carbonates, \$110,000.

Dr. Joseph M. Ready, The University of Texas Southwestern Medical Center, Enantioselective Atom Transfer Radical Additions to Olefins, \$110,000.

Dr. Brian W. Romans, Virginia Polytechnic Institute and State University, Do Muds Sort? Experimental Test of a Hypothesis Key to Understanding Marine Bottom Currents, \$110,000.

Dr. Sangjin Ryu, University of Nebraska-Lincoln, Effect of Confinement on Drop Coalescence: Lab Model Study of Oil Drop Coalescence for Enhanced Oil Recovery, \$110,000.

Dr. Tarek Sammakia, University of Colorado at Boulder, Acene Dimers: Synthesis, Structure, and Photochemical Properties, \$110,000.

Dr. Raymond E. Schaak, The Pennsylvania State University, Discovery of New Heterogeneous Catalysts for C-H Activation, \$110,000.

Dr. Jennifer M. Schomaker, University of Wisconsin-Madison, Strategies for Aldoxime and Ketoxime Umpolung: Versatile Syntheses of Amines and Heterocycles, \$110,000.

Dr. Daniel F. Shantz, Tulane University, Cerium Oxide Clusters and Particles as Catalysts for the Oxidation of Benzene to Phenol, \$110,000.

Dr. Devon A. Shipp, Clarkson University, Self-Healing, Shape-Memory Polyanhydrides, \$110,000.

Dr. Shahab Shojaei-Zadeh, Rutgers, The State University of New Jersey, Transport and Fate of Proppants in Fractured Rocks, \$110,000.

Dr. Karl W. Sohlberg, Drexel University, Is Extraction of Hydrogen from Hydrocarbons Using a Metal/Alumina Membrane Kinetically Feasible?, \$110,000.

Dr. Robson F. Storey, The University of Southern Mississippi, Probing the Role of Chain Stiffness in the Sonochemistry of Polymers, \$110,000.

Dr. Adam S. Veige, University of Florida, Homogeneous Catalytic Hydrogenolysis of Polyolefins, \$110,000.

Dr. Shengnian Wang, Louisiana Tech University, Synthesis of Hierarchically Porous Zeolites by Solid-State Crystallization and Their Catalytic Properties, \$110,000.

Dr. Qiang (David) Wang, Colorado State University, Multi-Scale Modeling of Real Polymer Melts, \$110,000.

Dr. Alexander Wei, Purdue University, Field-Effect Catalysis in Continuous-Flow Synthesis, \$110,000.

Dr. Andrew E.H. Wheatley, University of Cambridge, New Avenues in Nanocarrier System Design for the Delivery of Enhanced Methane Oxidation Catalysts, \$110,000.

Dr. H. Henning Winter, University of Massachusetts Amherst, Two-Dimensional Zeolite Generation from Layered Zeolite, \$110,000.

Dr. Shu Yang, University of Pennsylvania, Synthesis of Bumpy Core-Shell Polymeric Nanoparticles for Coffee Ring-Free Assemblies, \$110,000.

Dr. Minami Yoda, Georgia Institute of Technology, Structured-Illumination Microscopy (SIM) to Visualize Bubble Deformation and Breakup in Minichannel T-Junctions, \$110,000.

Dr. Chen Zhu, Indiana University Bloomington, Organic-Inorganic Interactions during Hydrocarbon Secondary Migration: Effects on Reservoir Quality, \$110,000.

Dr. Lei Zhu, Case Western Reserve University, A Combined Theoretical Simulation and Experimental Study on Electrostriction in Polymer/Ferroelectric Particle Nanocomposites, \$110,000.

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

Dr. Gregory W. Bishop, East Tennessee State University, Determining the Effects of Capping Agents on the Activity of Nanoparticle Electrocatalysts through Single-Nanoparticle Measurement Techniques, \$55,000.

Dr. Charlisa Daniels, Northern Kentucky University, Characterization of Methacrylate Porous Polymer Monoliths for Use as Oil Sorbers, \$55,000.

Dr. Casey Ann Dougherty, Iona College, A Deeper Look into Dendrimer Oil Demulsification and Recovery: The Importance of Dendrimer Generation and Surface Properties, \$55,000.

Dr. Jennifer A. Faust, The College of Wooster, Exploring Heterogeneous Reactions of Model Lubricant Films with Indoor Oxidants: Products, Kinetics, and Energetics, \$55,000.

Dr. Jonathan J. Foley, The William Paterson University of New Jersey, Light Initiated Energy Transfer to Petroleum-Derived Molecules Mediated by Hybrid Nanoparticles, \$55,000.

Dr. Douglas T. Genna, Youngstown State University, Synthesis of Stable Silyl Rh(III) Hydride Complexes for Alkene Functionalization Reactions, \$55,000.

Dr. Graham B. Griffin, DePaul University, Photo-Oxidation of Thiophene-Containing Moieties in Dyadic Model Systems, \$55,000.

Dr. Courtney L. Jenkins, Ball State University, Repurposing Petroleum Waste into Functional Materials, \$55,000.

Dr. Evan E. Joslin, Sewanee: The University of the South, Dehydrogenative Amide Synthesis Utilizing Ruthenium and Iron Catalysts via Traditional and Microwave Techniques, \$55,000.

Dr. Nathanael M. Kidwell, The College of William and Mary, Investigating the Nonadiabatic Chemical Transformations of Nitric Oxide Radicals with Molecular Partners Using State-Resolved Imaging, \$55,000.

Dr. Alexey Krasnoslobodtsev, University of Nebraska-Omaha, Exploring Synthetic Routes of Molecular Wire Formation via Photocatalytic Action of AuNP and AuNP-TiO₂ Assemblies, \$55,000.

Dr. Michael R. Krout, Bucknell University, Cross-Coupling Approach to β,β -Disubstituted Unsaturated Carbonyls, \$55,000.

Dr. Yangyang Liu, California State University, Los Angeles, Mechanism-Guided Design and Synthesis of Metal-Organic Frameworks with Optimized Pores for Methane Storage, \$55,000.

Dr. Martin R. McPhail, University of West Georgia, The Effects of Surface Chemistry on the Generation of Redox Equivalents in Lead Sulfide Quantum Dots for Heterogeneous Catalysis, \$55,000.

Dr. Melanie J. Michalak, Humboldt State University, Reconstructing Neogene Paleogeography and Forearc Basin Evolution of Southern Cascadia using Detrital Mineral Geochronology, \$55,000.

Dr. Michael R. Norris, University of Richmond, Systems for CO₂ Conversion to Value-Added Products with NADH Mimics, \$55,000.

Dr. Nicholas A. Piro, Albright College, New Chelating Guanidine Ligands for Late First-row Transition Metals and Their Use in Oxidative Transformations of Organic Substrates, \$55,000.

Dr. Graham T. Sazama, Lawrence University, Design and Synthesis of Persistent Luminescent Organic Radicals and Investigation of Doublet-State Photophysics, \$55,000.

Dr. Olaseni Sode, University of Tampa, Exploring the Many-Body Interactions in Condensed Phase CO₂: Development of a Novel Intermolecular Potential, \$55,000.

Dr. Christopher R. Turlington, Hope College, Exploration of Nitrile Oxidation Reactions: Towards Synthesis of Metal-Nitrene Complexes and Nitrene Transfer to Substrates, \$55,000.

Dr. Yalan Xing, The William Paterson University of New Jersey, Direct Difunctionalization of Alkynes by Radical Oxidative Coupling Reaction, \$55,000.

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

Dr. Orlando Ayala, Old Dominion University, On a More Rigorous Study of Pipeline Erosion in Bends Focused on Fluid-Particle Interaction Dynamics, \$70,000.

Dr. Christopher M. Burba, Northeastern State University, Synthesis and Characterization of a New Family of Solvate Ionic Liquids, \$70,000.

Dr. James M. Camara, Yeshiva University, Development of Group XIII Compounds with Weakened Metal-Halide Bonds for use in Transmetallation Reactions and Dual Catalyst Systems for the Functionalization of Alkanes, \$70,000.

Dr. Pabitra Choudhury, New Mexico Institute of Mining and Technology, Computational Design of Single-Atom Active Sites on Porous Surface for Natural Gas to Liquid Fuel Conversion, \$70,000.

Dr. Daniel M. Deocampo, Georgia State University, Iron Dynamics in Alkaline Lacustrine Systems: Implications for Deposition and Diagenesis, \$70,000.

Dr. Tabbetha A. Dobbins, Rowan University, Understanding Synergistic Effects of Nano-Confinement and Catalysis on Methane Gas and Syn-Gas Conversion to Liquid Fuels Using Synchrotron X-ray and Neutron Characterization, \$70,000.

Dr. John L. Haan, California State University, Fullerton, Understanding the Electronic Perturbation of Metal Catalysts Toward a More Efficient, Less Toxic Catalyst for the Electrochemical Reduction of Carbon Dioxide to Formate, \$70,000.

Dr. James M. Hanna, Winthrop University, Visible-Light-Promoted Reactions of Organoborates with Imines, \$70,000.

Dr. James P. Kercher, Hiram College, Gas Phase Ion Thermochemistry through Imaging Photoelectron Photoion Coincidence Mass Spectrometry, \$70,000.

Dr. Jun-Hyun Kim, Illinois State University, Regulating Self-Assembly of Short-Chain Amphiphilic Polymers, \$70,000.

Dr. Dmytro Kosenkov, Monmouth University, Modeling Impact of Intermolecular Interactions of LPG-Alcohol Mixtures on Stability of Phyllosilicates: Towards Improvement of Drilling Fluids, \$70,000.

Dr. Louis Y. Kuo, Lewis and Clark College, Fundamental Investigation of Sulfide Oxidation by New Bisoxido Molybdenum(VI) Catalysts, \$70,000.

Dr. Jennifer L. Morford, Franklin and Marshall College, Influence of Iron Sulfide Phase on the Incorporation of Mo in Marine Sediments, \$70,000.

Dr. Carol A. Parish, University of Richmond, An Atomistic Inquiry into the Driving Forces for Nano-Aggregation and Cluster Formation in Asphaltenes, \$70,000.

Dr. Charles E. Savrda, Auburn University, Comparative Analyses of Piped-Zone Ichnofabrics in Cretaceous-Paleocene Shelf-Sea Chalk-Marl Sequences, U.S. Gulf Coastal Plain, \$70,000.

Dr. Hans J. Schanz, Georgia Southern University, New Materials via Hydroamination and Hydroamidation, \$70,000.

Dr. Alireza Shahkarami, Saint Francis University, An Experimental Investigation of Microemulsion Phase Behavior at High Pressure and High Temperature Conditions, \$70,000.

Dr. Dasan M. Thamattoor, Colby College, New Photochemical Approaches to Cyclopropylidenes from Phenanthrene-Based Spiropentanes, \$70,000.

Dr. Sarah J. Titus, Carleton College, Making Laboratory Deformation Bands in Sandstones for Comparison with Natural Field Data from the San Andreas Fault System, \$70,000.

Dr. Patrick H. Willoughby, Ripon College, Synthesis of Polycyclic Aromatics via Domino Aryne Cascade Reactions, \$70,000.