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 Asphalten 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 Deslahra, 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. Peter Keckenes-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 Prigioebbe, 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 Sadler, 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 Diazoo 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 Analogues 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 Dilanthanide 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 Bohn, 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 Macrocycle 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 Macro cyclic 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. Doerr, 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) Formamidinates, $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. 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. Giovanniantonio Natale, University of Calgary, Multiscale Modeling in Drilling Fluids: Interactions between Cuttings and Nanoscale Particles, $110,000.

Dr. Aaron L. Odom, 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 Polyalhydrides, $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-TiO$_2$ Assemblies, $55,000.

**Dr. Michael R. Krout**, Bucknell University, Cross-Coupling Approach to $\beta,\beta$-Disubstituted Unsaturated Carboxyls, $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 CO$_2$ 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 CO$_2$: 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.