

Grants Awarded 2019

Doctoral New Investigator

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

Dr. Oliviero Andreussi, University of North Texas, Gas Hydrates Inhibition and Promotion: A First-principles High-Throughput Approach, \$110,000.

Dr. Jeffrey Bandar, Colorado State University, The Development of New Base-Catalyzed Heteroarene Functionalization Reactions, \$110,000.

Dr. Peter J. Beltramo, University of Massachusetts Amherst, Interferometric Imaging and Assembly of Nanoparticles at Fluid Interfaces, \$110,000.

Dr. Christina S. Birkel, Arizona State University, Understanding and Manipulating the Surface Chemistry of MXenes to Enable Their Use as Cracking Catalysts, \$110,000.

Dr. Margaret L. Byron, The Pennsylvania State University, Formation and Settling of Multiphase Aggregates under Controlled Isotropic Turbulence, \$110,000.

Dr. David C. Cantu, University of Nevada, Reno, Uncovering the Role of Lanthanum in Faujasite Hydrothermal Stability, \$110,000.

Dr. Matthew Burke Chambers, Louisiana State University, Photochemical Upgrading of Light Hydrocarbons Mediated by Early Transition Metal Oxo Complexes, \$110,000.

Dr. Kensha Clark, The University of Memphis, Design of Transition Metal-Based Frustrated Lewis Pairs, \$110,000.

Dr. James F. Davies, University of California, Riverside, The Vapor Pressure of Dicarboxylic Acids in Mixed Organic Liquids, \$110,000.

Dr. Sanket A. Deshmukh, Virginia Polytechnic Institute and State University, Computational Design of Metal-Organic Frameworks for Alkane Separations, \$110,000.

Dr. Elizabeth Elacqua, The Pennsylvania State University, Controlled Synthesis of Donor-Acceptor Polymers Derived from [2.2]Cyclophanes, \$110,000.

Dr. Xiaofeng Feng, University of Central Florida, Ambient Electrocatalytic Activation of Methane Towards C₂ Oxygenates, \$110,000.

Dr. Michele Galizia, University of Oklahoma, Fundamental Transport Property-Structure Correlations for Organic Solvent Nanofiltration Membranes, \$110,000.

Dr. Vamsi Ganti, University of California, Santa Barbara, Quantifying the Sedimentary Record of Bedform Disequilibrium, \$110,000.

Dr. Maya Gomes, The Johns Hopkins University, Development of (Blue) Carbon Preservation Hotspots across Gradients in Oxygen and Organic Matter Type, \$110,000.

Dr. Samer Gozem, Georgia State University, Calculation of Photoelectron Circular Dichroism of Small Chiral Organic Molecules, \$110,000.

Dr. Dugan Hayes, University of Rhode Island, Elucidating Mechanisms of Transition Metal Catalyzed Photochemical Transformations of Petroleum-Derived Substrates Using X-Ray Transient Absorption Spectroscopy, \$110,000.

Dr. Safa Jamali, Northeastern University, Flow Assurance Rheology of Multi-Phasic Crude Oil, \$110,000.

Dr. Shan Jiang, Iowa State University, Film Formation of Polymeric Janus Dumbbell Particles through Supracolloidal Assembly, \$110,000.

Dr. Reika Katsumata, University of Massachusetts Amherst, Polymeric Bi-Layer Design to Leverage Wetting Transparency for Water/Oil Separation, \$110,000.

Dr. Kathryn E. Knowles, University of Rochester, Colloidal Copper and Copper(I) Oxide Nanocrystals as Redox-Tunable Multi-Functional Catalysts and Photocatalysts for Cross-Coupling Reactions, \$110,000.

Dr. Song Lin, Cornell University, Enantioselective Electrocatalysis for the Functionalization of Alkenes, \$110,000.

Dr. Feng Lin, Virginia Polytechnic Institute and State University, Continuously Tunable Metal Oxides as the Modular Platform for Catalytic Applications, \$110,000.

Dr. Mark C. Lipke, Rutgers, The State University of New Jersey (New Brunswick), Using Nanoconfinement to Control Radical Intermediates during Catalytic C-H Oxidations, \$110,000.

Dr. Chong Liu, University of California, Los Angeles, Nanowire-Enabled Conversion of CH₄ to CH₃OH with a Spatially Defined Catalytic Cycle, \$110,000.

Dr. Yuanyue Liu, The University of Texas at Austin, Understanding and Discovering Atomically-Thin Transition Metal Dichalcogenides Catalysts for Syngas Production by Using Grand Canonical DFT, \$110,000.

Dr. Xiaolei Liu, University of Oklahoma, The Isotope Compositions of Complete Archaeal Tetraethers Analyzed Separately in Parallel and Antiparallel Glycerol Configurations: A Potential Approach to Disentangle Signals of Heterogeneous Sources, \$110,000.

Dr. Zhenfei Liu, Wayne State University, First-Principles Computational Study and Design of Metal-Organic Frameworks for Separation of Small Hydrocarbons, \$110,000.

Dr. Robert C. Mahon, University of New Orleans, Controls on Grain-Size Lining and Sediment Deposition across Delta Fronts, \$110,000.

Dr. Karthish Manthiram, Massachusetts Institute of Technology, Catalytic Network for Electrochemically-Driven Activation of Methane to Produce Formaldehyde, \$110,000.

Dr. Andrew J. Medford, Georgia Institute of Technology, Elucidating Intrinsic Selectivity of Oxidative Dehydrogenation Catalysts via Transient Kinetic Models, \$110,000.

Dr. Quentin Michaudel, Texas A&M University, Conductive Polymers with a Twist: New Tools for the Synthesis and Study of Distorted Graphene Nanoribbons, \$110,000.

Dr. Phillip J. Milner, Cornell University, Construction of Crystalline Organic Frameworks from Petroleum Feedstocks via Olefin and Alkyne Metathesis, \$110,000.

Dr. Aaron Morris, Purdue University, Elucidating the Fluid Dynamics of Non-Spherical Particles, \$110,000.

Dr. Jia Niu, Boston College, Controlled Synthesis of Functional Polymers via Radical Cascade-Triggered Ring-Opening Polymerization, \$110,000.

Dr. Qifei Niu, Boise State University, Factors Controlling the Streaming Potential of Heterogeneous Porous Rocks in Two-Phase Flow Conditions, \$110,000.

Dr. Casey O'Brien, University of Notre Dame, Elucidation of CO₂ Transport Mechanisms in Polyvinylamine-Based Facilitated Transport Membranes, \$110,000.

Dr. Zachariah A. Page, The University of Texas at Austin, Tailored Photopolymer Network Design from Commodity Building Blocks, \$110,000.

Dr. Lei Pan, Michigan Technological University, Disjoining Pressures and Film Instability in Oil-Brine-Mineral Systems, \$110,000.

Dr. Kimberly M. Parker, Washington University in St. Louis, Behavior of Enzymes at the Interfaces of Minerals and Non-Aqueous Liquids, \$110,000.

Dr. Joseph P. Patterson, University of California, Irvine, Investigating Petrochemical Derived Polymer Self-Assembly in Organic Solvents using Liquid Phase Transmission Electron Microscopy, \$110,000.

Dr. Christian Pester, The Pennsylvania State University, Heterogeneous Photoredox Polymerization Catalysis, \$110,000.

Dr. Alexander P. Petroff, Clark University, Experimental Investigation of Oxygen Dynamics in Natural Sediment, \$110,000.

Dr. Nicholas J. Race, University of Minnesota, The Phenonium Ion as a Controlling Element in Site- and Stereoselective Functionalization Reactions, \$110,000.

Dr. Hang Ren, Miami University, Mapping the Kinetics for Solid Nucleation via Nanoscale Electrochemical Imaging, \$110,000.

Dr. M. Toufique Reza, Florida Institute of Technology, Thermodynamics and Kinetics of BTX Phase Transfer from Alkanes to Phosphonium-based Deep Eutectic Solvents: Experimental Studies and Computational Modeling, \$110,000.

Dr. Jeffrey Richards, Northwestern University, Probing Rotational Dynamics of Nanoparticle Dispersions via Dielectric Spectroscopy, \$110,000.

Dr. Luke T. Roling, Iowa State University, Dynamic Catalyst Design for Mitigating Deactivation in Ethane Dehydrogenation, \$110,000.

Dr. Alban Sauret, University of California, Santa Barbara, Interfacial Flows of Suspension in Model Porous Media, \$110,000.

Dr. Brett M. Savoie, Purdue University, The Molecular Origin of Processing-Function Relationships in Petroleum-Derived Plastic Semiconductors, \$110,000.

Dr. Valerie A. Schmidt, University of California, San Diego, Copper-Catalyzed Photocycloadditions for 4-Membered Heterocycle Synthesis, \$110,000.

Dr. Devin L. Shaffer, University of Houston, Mechanism of Wettability Alteration and Its Impacts on Immiscible Fluid Displacement in Carbonate Porous Media, \$110,000.

Dr. Shaama Sharada, University of Southern California, Atomically Dispersed Catalysts for Direct Conversion, \$110,000.

Dr. Glenn R. Sharman, University of Arkansas, Sea Level Control on Sediment Erosion and Dispersal in Tectonically Active Settings: Implications for Predicting Deep-Water Reservoir Quality, \$110,000.

Dr. Carlos A. Silvera Batista, Vanderbilt University, Measuring Solvent Organization around NPs of Heterogeneous Surface Chemistry for Applications in Oil Recovery, \$110,000.

Dr. Kelsey A. Stoerzinger, Oregon State University, Tailoring the Partial Oxidation of Methane through Electrocatalysis, \$110,000.

Dr. Daniel L.M. Suess, Massachusetts Institute of Technology, Revealing Factors that Control Chain-Length Selectivity in the Homogeneous Conversion of CO to Higher-Order Hydrocarbons, \$110,000.

Dr. John Swierk, State University of New York at Binghamton, Photochemical Oxidation of Refractory Sulfur Compounds for Fuel Desulfurization, \$110,000.

Dr. Pratyush Tiwary, University of Maryland, Fundamental Insight into Zeolite Nucleation through Statistical Mechanics Based All-Atom Sampling Methods, \$110,000.

Dr. Mark Albert Torres, Rice University, Coupling Autogenic Sedimentation to the Geologic C Cycle Using New Theory and Data, \$110,000.

Dr. Zachary W. Ulissi, Carnegie Mellon University, Exploiting Catalyst Composition and Disorder for the Direct Conversion of Syngas to Multi-Carbon Products, \$110,000.

Dr. William E. Uspal, University of Hawaii at Manoa, Catalytically Active Colloidal Suspensions: from Single Particle to Bulk Behavior, \$110,000.

Dr. Yan Wang, University of Nevada, Reno, Thermal Transport in Clathrate Hydrate: Role of Lattice Instability and Irregularity, \$110,000.

Dr. Patricia B. Weisensee, Washington University in St. Louis, Influence of Heat Transfer on Emulsion Flow in Porous Media: An Experimental Pore-Scale Analysis, \$110,000.

Dr. Alison E. Wendlandt, Massachusetts Institute of Technology, Boroxyl Radical Catalysts for the Anti-Markovnikov Hydration and Functionalization of Olefins, \$110,000.

Dr. Javen S. Weston, University of Tulsa, The Effect of Surface Wettability on the Observed Rheology of Complex Fluid Flow in Microcapillaries, \$110,000.

Dr. Zachary Wickens, University of Wisconsin-Madison, Electrochemically-Primed Organic Photocatalysis: A Mild Strategy for Challenging Reductions, \$110,000.

Dr. Taylor J. Woehl, University of Maryland, Mapping Heterogeneous Nanocrystal Formation Kinetics on Catalyst Supports for Controlled Liquid Phase Synthesis of Bimetallic Catalysts, \$110,000.

Dr. Guoping Xiong, University of Nevada, Reno, Mechanisms of Plasma-Catalytic Petroleum Upgrading, \$110,000.

Dr. Joseph M. Zadrozny, Colorado State University, Rare-Earth Magnetic Control of Organic Reactions, \$110,000.

Dr. Qiang Zhang, Washington State University, Hierarchically Porous Materials Constructed from Simple Linkers, \$110,000.

Dr. Yingjie Zhang, University of Illinois at Urbana-Champaign, In-Situ Imaging and Spectroscopy of Asphaltene Adsorption at Oil-Solid Interfaces, \$110,000.

New Directions

Awards for Fundamental Research

Dr. Sara Abedi, Texas A&M University, Towards Characterization and Modeling of Rock-Fluid Interaction in CO₂-EOR Process, \$110,000.

Dr. Alan M. Allgeier, University of Kansas, Relating Nuclear Magnetization Relaxation Rates to Surface Chemistry of Carbonaceous Materials to Advance the Characterization of Petroleum Deposits, \$110,000.

Dr. Aaron Aponick, University of Florida, Vanadium-Mediated Deoxygenative Allylation of Alcohols for the Formation of Quaternary Carbons, \$110,000.

Dr. Alexander Ayzner, University of California, Santa Cruz, Electron/Ion Coupling and Thermodynamics of π -Conjugated Polyelectrolyte Complex Coacervates, \$110,000.

Dr. John F. Berry, University of Wisconsin-Madison, Incorporation of Hypercoordinate Carbide Ligands into Bio-Inspired Coordination Clusters toward Promiscuous Hydrogenation Reactivity, \$110,000.

Dr. Guy Bertrand, University of California, San Diego, Mesoionic Compounds: A Novel Family of Organocatalysts, \$110,000.

Dr. Jorge A. Boscoboinik, State University of New York at Stony Brook, Transient Kinetic Studies of Hydrocarbon Chemistry on Two-Dimensional Zeolite Models, \$110,000.

Dr. Giuseppe Buscarnera, Northwestern University, Fluidization of Water-Saturated Sediments: Explaining Seabed Instability through Digital Imaging and Network Modeling, \$110,000.

Dr. Cheng Chen, Virginia Polytechnic Institute and State University, Fundamentals of Proppant Compaction and Embedment in Hydraulic Fractures, \$110,000.

Dr. Xiang Cheng, University of Minnesota, Measuring the Pressure and Shear Stress Distribution of Impacting Liquid Drops, \$110,000.

Dr. Shawn K. Collins, University of Montreal, Biocatalytic Dynamic Kinetic Resolution as a Novel Route to Planar Chiral Macrocycles, \$110,000.

Dr. Arash Dahi Taleghani, The Pennsylvania State University, Relative Permeability under Stress, \$110,000.

Dr. Robert H. Davis, University of Colorado at Boulder, Fundamentals of Hydrophobic Particle Capture, \$110,000.

Dr. Mattanjah S. de Vries, University of California, Santa Barbara, Exploring the Conformational Landscapes of Isolated Polymers, \$110,000.

Dr. Gerald Debenest, Institut National Polytechnique de Toulouse, Analysis of bi-Lubricated Flows over Rough Surfaces for Improving Enhanced Oil Recovery Strategy, \$110,000.

Dr. Aaron F. Diefendorf, University of Cincinnati, Environmental and Thermal Controls on Diatom Highly Branched Isoprenoids for Oil-Source Rock Correlation, \$110,000.

Dr. Yifu Ding, University of Colorado at Boulder, Probe and Control Active Dissipation Zone during Fracture Using Photoplastic Polymers, \$110,000.

Dr. Emilie Dressaire, University of California, Santa Barbara, Fragmentation of Emulsions, \$110,000.

Dr. William A. Ducker, Virginia Polytechnic Institute and State University, Diffusion in Nanoscale Cracks, \$110,000.

Dr. Daniel E. Falvey, University of Maryland, Controlled Radical Polymerization Initiated by Sequential Two-Photon Light Absorption, \$110,000.

Dr. David J. Flannigan, University of Minnesota, Precisely-Controlled Pulsed Electron Beams for Studies of Radiation-Sensitive Materials, \$110,000.

Dr. Tori Z. Forbes, University of Iowa, Assessment of Chemical and Physical Changes within Conodont Elements upon Thermal Maturation., \$110,000.

Dr. Ziad Ganim, Yale University, Single Molecule Structure and Spectroscopy of π -Conjugated Polymers, \$110,000.

Dr. Stephen S. Gao, Missouri University of Science and Technology, Crustal Structure and Subsidence of the Williston Basin: Constraints from Modeling of Gravity Data, \$110,000.

Dr. David S. Glueck, Dartmouth College, Metal-Catalyzed Enantioselective Hydration of Nitriles, \$110,000.

Dr. Sean P.S. Gulick, The University of Texas at Austin, Intramolecular Distribution of Carbon-13 as a Biomarker of Petroleum Products of Diverse Origin, \$110,000.

Dr. Elizabeth A. Hajek, The Pennsylvania State University, Evaluating the Role of Sediment-Transport Dynamics in Organic Carbon Burial and Preservation, \$110,000.

Dr. Michael P. Harold, University of Houston, Zeolitic Imidazolate Framework Membranes for Alkane Conversion to Olefins and H₂, \$110,000.

Dr. Yun Hang Hu, Michigan Technological University, Synthesis and Characterization of Independent Atomic Carbon Chains, \$110,000.

Dr. Joseph L. Keddie, University of Surrey, Self-Stratification of Bimodal Linear and Star Polymers during the Drying of Thin Films, \$110,000.

Dr. Eunsuk Kim, Brown University, Bio-inspired Molecular Catalysts for Sulfur Atom Transfer Reactions, \$110,000.

Dr. Nikolay Kornienko, University of Montreal, Electrosynthesis of Hydrocarbons and Alcohols at the Nanocrystal-MOF Interface, \$110,000.

Dr. Heather J. Lewandowski, University of Colorado at Boulder, High Resolution Spectroscopy of Metal Oxide Clusters, \$110,000.

Dr. Alexander R. Lippert, Southern Methodist University, Synthetic Methods for Single Molecule Chemistry Using Single Molecule Localization Microscopy, \$110,000.

Dr. Zhanfei Liu, The University of Texas at Austin, Deciphering Molecular Level Information of Sinking Marine Particles Using a Novel Thermal-Slicing Pyrolysis Coupled with Gas Chromatography Mass Spectrometry, \$110,000.

Dr. Cynthia V. Looy, University of California, Berkeley, A Fire Regime Framework for Understanding Paleofire in the Pennsylvanian: The Role of Hyperoxic Wildfire in Coal Swamp Carbon Preservation, \$110,000.

Dr. Heather R. Lucas, Virginia Commonwealth University, Tunable Nickel and Cobalt Complexes for Oxidative Conversion of Petrochemicals, \$110,000.

Dr. Jodie L. Lutkenhaus, Texas A&M University, Organic Radical Polymer - Solvent Interactions, \$110,000.

Dr. Gregory B. McKenna, Texas Tech University, Antiplasticization, Nanoparticles, and Fragility: A Novel Framework for Improving Polymer Properties, \$110,000.

Dr. Anne J. McNeil, University of Michigan, Degradable and Restructurable Polymers with Diverse Architectures from Petroleum Feedstocks, \$110,000.

Dr. Timothy R. Newhouse, Yale University, Allyl-Nickel Catalysis for Nucleophilic Functionalization of Alkenes, \$110,000.

Dr. Scott R.J. Oliver, University of California, Santa Cruz, Ionothermal Synthesis of New MAPO-n Zeotypes for Methanol to Olefin Conversion, \$110,000.

Dr. Hyowon Park, University of Illinois at Chicago, Understanding Strongly Correlated Electronic Structures and Energetics of the Late Transition Metal Oxide Surfaces from First-Principles, \$110,000.

Dr. Nikolai V. Priezjev, Wright State University, Modeling of the Contact Angle Hysteresis and Wetting Properties of Oil Droplets on Textured Surfaces, \$110,000.

Dr. Ana Christina Ravelo, University of California, Santa Cruz, Foraminifera-bound Nitrogen Isotopes: A Novel Tool to Understand Nutrient Cycling in the Geologic Record, \$110,000.

Dr. Andrey Rogachev, Illinois Institute of Technology, Deep Understanding of Catalytic Activity Through High-Level Calculations, \$110,000.

Dr. Preston T. Snee, University of Illinois at Chicago, Metal Phosphide Catalysts Prepared by Direct Conversion of P₄, \$110,000.

Dr. Erik Sperling, Stanford University, Tracking Organic Carbon Deposition in Space and Time, \$110,000.

Dr. Pericles Stavropoulos, Missouri University of Science and Technology, Ferrocenes and other Metallocenes in Atom/Group-Transfer Chemistry, \$110,000.

Dr. Morgan Stefik, University of South Carolina, Fluorophobic Interactions for Multimodal Nanoparticle-Polymer Assemblies, \$110,000.

Dr. Maureen Tang, Drexel University, Determining the Mechanism of Heterogeneous Electrocatalytic Cyclohexane Oxidation, \$110,000.

Dr. Dean J. Tantillo, University of California, Davis, Theoretical Studies of Photochemical Processes Leading to Polycyclic, \$110,000.

Dr. Jessica E. Tierney, University of Arizona, Determination of Ancient Depositional Environments via Multivariate Analyses of Glycerol Ether Lipids, \$110,000.

Dr. Steven D. Townsend, Vanderbilt University, Free-Radical Based Desulfurative Cross-Coupling, \$110,000.

Dr. John F. Trant, University of Windsor, Organic Molecular Tubes from Self-Immolative Pseudo-Rotaxanes, \$110,000.

Dr. Troy Van Voorhis, Massachusetts Institute of Technology, Computational Design of Molecularly-Functionalized Electrodes for Oxygen Reduction in Fuel Cells, \$110,000.

Dr. Sergey A. Varganov, University of Nevada, Reno, Iron-Catalyzed Multi-State C(sp²)-H Activation, \$110,000.

Dr. Bryan D. Vogt, The Pennsylvania State University, Miscible Polymer Blend Nanocomposites from Capillary Rise Infiltration, \$110,000.

Dr. Valentine I. Vullev, University of California, Riverside, How Electric Dipoles Affect the Activity of Photoredox Catalysts?, \$110,000.

Dr. Shi-Qing Wang, The University of Akron, Exploring Molecular Framework for Mechanics of Semicrystalline Polymers, \$110,000.

Dr. You-Yeon Won, Purdue University, Studies of Glassy Domains in Block Copolymer Micelles and Langmuir Monolayers Using NMR and Particle Tracking Techniques, \$110,000.

Dr. Jianzhong Wu, University of California, Riverside, A Theoretical Study of Wettability Reversal during Low Salinity Waterflooding, \$110,000.

Dr. Ning Wu, Colorado School of Mines, Fundamental Investigation of Functionalized Nanoparticles as Effective Gas Hydrate Anti-Agglomerants, \$110,000.

Dr. Yue Wu, University of North Carolina at Chapel Hill, Wettability Characterization Using the Dielectric Properties of Interfacial Water, \$110,000.

Dr. Joel Yuen-Zhou, University of California, San Diego, Thermally-Activated Organic Reactions Under Vibrational-Strong-Coupling, \$110,000.

Dr. Martin T. Zanni, University of Wisconsin-Madison, Understanding Asphaltene Aggregation by Utilizing the Non-Linear Nature of 2D-WhiteLight Spectroscopy, \$110,000.

Dr. Zhenrong Zhang, Baylor University, In Situ Advanced Raman Spectroscopies Study of Plasmon-Assisted Catalytic Oxidative Desulfurization on Iron Oxide Catalysts, \$110,000.

Dr. Hua Zhao, University of Northern Colorado, Liquefying Coal via Enzymatic Depolymerization Using Non-Aqueous Task-Specific Ionic Solvents, \$110,000.

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

Dr. Mohammed F. Al Dushaishi, Texas A&M International University, Dynamical Stability of a Rotating Cylinder Subjected to Internal and External Non-Newtonian Axially Flowing Fluid, \$55,000.

Dr. Miriam A. Bowring, Reed College, Proton Tunneling in Organometallic Hydrocarbon Activation, \$55,000.

Dr. Jacquelyn Nicole Bracco, City University of New York, Queens College, Metal-Organic Ligand Complexation at the Mineral Water Interface, \$55,000.

Dr. Amanda S. Case, Augsburg University, Kinetics of Aromatic Peroxy Radicals in Combustion Chemistry, \$55,000.

Dr. Yongming Deng, Western Kentucky University, Photoredox Catalyzed Oxidative Functionalization of Alkynes with Amine N-Oxides: A New Alkyne Activation Strategy, \$55,000.

Dr. Ran Drori, Yeshiva University, Interactions of Kinetic Inhibitors with Gas Hydrate Surfaces, \$55,000.

Dr. Geoffrey J. Gilleaudeau, George Mason University, Redox Gradients in Lower Mississippian Black Shales of North America: A Test Case for Uranium Isotope Behavior, \$55,000.

Dr. Isabel X. Green, Illinois State University, Using in Situ Transmission Infrared Spectroscopy for Mechanistic Studies of Direct Methane to Methanol Conversion over Copper-Exchanged Zeolite Catalysts, \$55,000.

Dr. Stephen T. Heller, Loyola Marymount University, Upcycling Petroleum-Derived Lactams: Ring Expansion via Net Insertion into C-N Bonds to Access Saturated or Benzannulated Azacycles, \$55,000.

Dr. Miles W. Johnson, University of Richmond, Modular and Rational Design of Pyrrolyl Phosphine Ligands for Nickel Catalysis, \$55,000.

Dr. Michael B. Larsen, Western Washington University, Development of the Thermal Guanidine Exchange Reaction for a New Class of Covalent Adaptable Networks, \$55,000.

Dr. Altug S. Poyraz, Kennesaw State University, A Fundamental Study on the Formation of Tunable Mesopore Network in Petroleum Coke with Tunable Surface Functionality, \$55,000.

Dr. Luis A. Rivera-Rivera, Ferris State University, Fundamental Simulations of Excited Ethane Molecule Relaxation in High-Pressure Bath Gases, \$55,000.

Dr. Oluwaseun Salako, City University of New York, Medgar Evers College, Microrheology Of Gas Hydrate Suspension, \$55,000.

Dr. Liaosha Song, California State University, Bakersfield, Three-Dimensional Characterization of Sandstone Reservoirs Using High-Resolution X-ray Microtomography, \$55,000.

Dr. Andrea L. Stevens Goddard, Rowan University, Investigating Mechanisms for Post-Depositional Heating in Sedimentary Basins: A Case Study in the Michigan Basin, USA, \$55,000.

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

Dr. Mark E. Bussell, Western Washington University, Nickel-Palladium Phosphide Catalysts for the Selective Hydrogenation of Acetylene, \$70,000.

Dr. Sanchari Chowdhury, New Mexico Institute of Mining and Technology, Understanding the Dynamics of Photoexcited Carriers in Multicomponent Plasmonic Nanomaterials Towards Rational Design of the Photothermal Catalyst, \$70,000.

Dr. Philip J. Costanzo, California Polytechnic State University, Development of Responsive Surfactants for Improved Oil Recovery, \$70,000.

Dr. Mary Grace I. Galinato, Pennsylvania State University, The Behrend College, Organosulfur Oxidation Catalyzed by Silica Sol-Gel Manganese Porphyrin-Serum Albumin Complex: Selective Control by Axial Ligand Effects, \$70,000.

Dr. Jason G. Gillmore, Hope College, Increasing Structural Diversity of Long-Wavelength Azo Dyes to Tune Wavelength and Add Synthetic Handles, \$70,000.

Dr. Bosiljka Glumac, Smith College, Modification of Reefal Carbonate Reservoir Properties by Algal and Microbial Encrusters, \$70,000.

Dr. Josefa Guerrero Millan, Augusta University, Effects of Surface Charge in Water-Oil Interfaces, \$70,000.

Dr. Timothy J. Hubin, Southwestern Oklahoma State University, High Valent Pd and Ni complexes of Topologically Constrained Azamacrocycles for Catalytic Organometallic C-C Bond Formation, \$70,000.

Dr. Brice Lacroix, Kansas State University, Refining Syn-Tectonic Diagenetic History of Carbonates from the Arbuckle Mountains using $\Delta 47/(U-Pb)$ Thermochronometry, a new and Emerging Geochemical Technique, \$70,000.

Dr. Jerry L. LaRue, Chapman University, Hot Electron Chemistry on Bimetallic Plasmonic Nanoparticles, \$70,000.

Dr. Kevin M. Miller, Murray State University, Exploring the Frontiers of Thermal Stability: Synthesis and Properties of Tetraarylphosphonium Poly(ionic liquid)s, \$70,000.

Dr. Sundeep Rayat, Ball State University, Impact of Ligand Topology and Electronic Nature on the Crystalline Structure of Coordination Polymers, \$70,000.

Dr. Andrew D. Sommers, Miami University, Surface Energy Measurements and Condensation Heat Transfer Performance of Hydrate Inhibitor Fluids on Robust Omniphobic Surfaces, \$70,000.

Dr. Jacob T. Stewart, Connecticut College, High-Resolution Infrared Spectroscopy of Jet-Cooled Conjugated Dienes, \$70,000.

Dr. Brian C. Utter, Bucknell University, Experimental Analysis of Grain-Scale Suspension Clogging through Millifluidic Obstacle Arrays, \$70,000.

Dr. Paul A. Wiget, Samford University, Kinetic Investigation of the Degree of Hyperconjugation and Anchimeric Assistance in Constrained Oxocanes via Hammett and Swain-Scott Analyses, \$70,000.

Dr. Amanda Wilmsmeyer, Augustana College, Adsorption Kinetics of Asphaltene-Relevant Heterocyclic Aromatic Compounds to Amorphous Silica, \$70,000.

Dr. Yanfeng Yue, Delaware State University, Microporous Carbon Monolith Synthesis and Natural Gas Adsorption, \$70,000.

Dr. James J. Zambito, Beloit College, Using Biomarkers to Test the Impact of Forest Evolution on the Organic Matter Composition of Marine Black Shales, \$70,000.

Dr. Deanna L. Zubris, Villanova University, Probing the Role of Ligand Electronics in Iron-Catalyzed ATRP, \$70,000.