MICKEY LELAND ENERGY FELLOWSHIP

INTERNSHIP PROGRAM

Sponsored by the U.S. Department of Energy Office of Fossil Energy

2014 TECHNICAL FORUM

U.S. DEPARTMENT OF ENERGY

http://energy.gov/fe/mickey-leland-energy-fellowship

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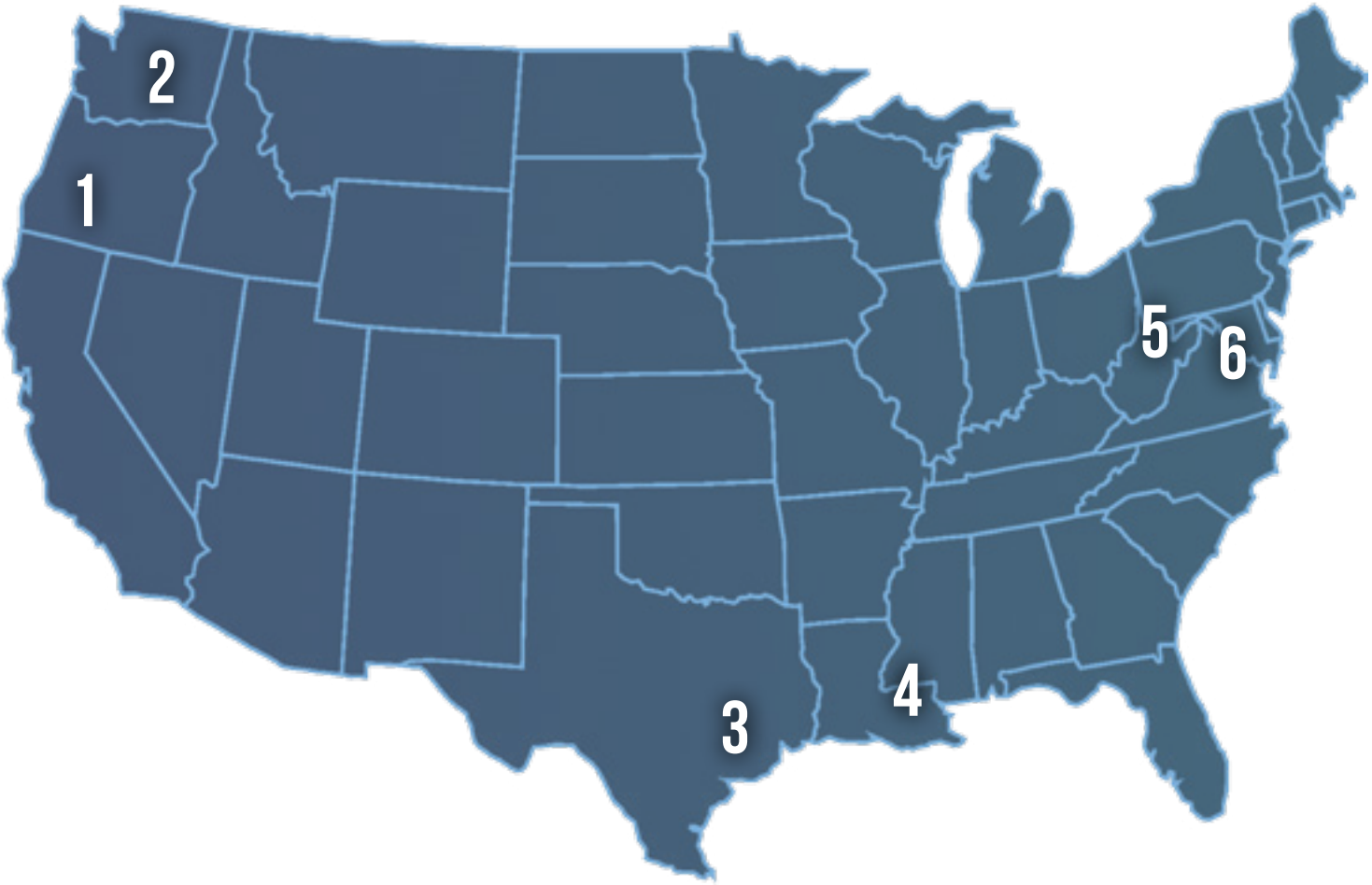


2014 Intern Locations:

1 NATIONAL ENERGY TECHNOLOGY LABORATORY, ALBANY, OR

2 PACIFIC NORTHWEST NATIONAL LABORATORY, RICHLAND, WA

3 STRATEGIC PETROLEUM RESERVE, BRYAN MOUND SITE, FREEPORT, TX

4 STRATEGIC PETROLEUM RESERVE, NEW ORLEANS, LA

5 NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA
NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

6 U.S. DEPARTMENT OF ENERGY HEADQUARTERS, WASHINGTON, DC
OFFICE OF FOSSIL ENERGY, FORRESTAL, WASHINGTON DC
GERMANTOWN, MD

GEORGE THOMAS "MICKEY" LELAND

Mickey Leland was a six-term U.S. Congressman and Texas state representative who was best known for focusing much-needed attention on issues of health and hunger. He was an effective spokesman for the hungry and rallied support which resulted in both public and private action to reduce hunger in the U.S. and throughout the world.

Mr. Leland was born on November 27, 1944 in Lubbock, Texas to Alice and George Leland II. He moved to Houston's Fifth Ward at a young age with his mother and brother. In 1964 he graduated in the top ten percent of his class from Houston's Phyllis Wheatley High School. While attending Texas Southern University (TSU), he became a vocal leader of the local civil rights movement and brought national leaders of the movement to Houston. He graduated from TSU's School of Pharmacy in 1970 with a Bachelor of Science. From 1972 to 1977 he served in the Texas state legislature in Austin representing Houston's 88th District. As a state representative he became famous as a champion of health care rights for the poor.

In 1978, Mr. Leland was elected to the United States Congress from the 18th Congressional District in Houston. His ability to reach out to others with innovative ideas and to gain support from unlikely sources was key to his success in effectively addressing the problems of the poor and minorities. Congressman Leland led an eight-member House of Representatives delegation on a tour of famine stricken areas in Ethiopia. Increasingly active in international human rights and world hunger issues, he worked tirelessly to solve the problems of hunger and malnutrition around the world. On August 7, 1989 while leading a humanitarian mission to a United Nations refugee camp, his plane crashed in a mountainous region of Ethiopia. He was accompanied on this trip by members of his staff, State Department officials, and Ethiopian nationals. There were no survivors.

In 2000, then-Secretary of Energy Bill Richardson renamed the Office of Fossil Energy's Minority Education Initiative the Mickey Leland Energy Fellowship. The more than 100 members of the class of 2000 became the first Mickey Leland Energy Fellows. Mr. Richardson stated that the ceremony to honor the late Congressman would be a way to "remember a great American who dedicated his life to expanding human potential." He added that he "could find no better way to honor [Mr. Leland's] memory than to endow his name on a program that will elevate the opportunities for future generations of minority students."

ABOUT THE MICKEY LELAND ENERGY FELLOWSHIP PROGRAM

10-Week Summer Internship Program

The Mickey Leland Energy Fellowship (MLEF) Program is headquartered in Washington, DC, and is sponsored by the Office of Fossil Energy (FE), U.S. Department of Energy. MLEF's mission is to encourage women and under-represented minority students majoring in Science, Technology, Engineering and Mathematics (STEM), to apply their academic achievements to actual research and gain hands-on experience as they prepare to enter the workforce. All eligible candidates can apply for this program.

The 10-week summer internship may place students at one of several possible FE sites including: the Strategic Petroleum Reserve site in Louisiana; the National Energy Technology Laboratory sites in Pittsburgh, Pa., Morgantown, W.V., and Albany, Ore.; and the Department of Energy Headquarters sites in Washington, D.C., and Germantown, Md. During the ?nal week of the program, MLEF Fellows attend a Technical Forum and present their internship project to their peers, mentors, site representatives, and senior FE managers.

Selected MLEF Fellows will receive:

- A weekly stipend of $600 for undergraduate students
- A weekly stipend of $750 for Master's students
- A weekly stipend of $850 for Doctoral and Postdoctoral students
- Approved temporary relocation costs to and from your host site
- Approved housing allowance based on appointment location
- Approved travel reimbursement to the Technical Forum

The Mickey Leland Energy Fellowship Program was awarded the Secretary of Energy's EEO/Diversity Best Practices Award in 2007.

CAPTAIN (RET) ERNEST R. HUNTER SR., P.E., ACP

MLEF Program Co-Founder
Former Deputy Assistant Secretary
Department of Energy

Mr. Hunter served as the Director of Physical Plant/Facilities Services for The University of Texas at Austin for six years. In this position, he was responsible for a 1000-person workforce that providing facilities services including maintenance and operations, architect and engineering services, custodial services, landscape services, and general support services to two campuses of over 50,000 students, 20,000 faculty and staff, 16 million gross square feet of space and 800 acres of grounds with an annual budget of over $50 Million. He implemented a significant strategic restructuring of the Physical Plant organization greatly improving service delivery and organizational management all work units. Under his leadership, the University of Texas at Austin Physical Plant/Facilities Services organization became a benchmark of excellence and gained national recognition for its Custodial Services program, Landscape Service program, Preventative Maintenance program, and its strategic change management activities. He hosted numerous benchmark visits from organizations seeking to learn from his efforts.

Prior serving as Directors, Mr. Hunter served as the Assistant Director of Support Services in the Physical Plant from 1999-2001. In this position, he was responsible for the oversight of three Physical Plant divisions - Custodial Services, Landscape Services, and General Services He was also responsible for the university's vehicle fleet operations, automotive repair shop, refuse and recycling program, pest control, surplus property operations, and transportation support.

Before arriving at UT Austin, Mr. Hunter held a wide-variety of leadership, managerial and technical positions throughout a 26-year career in the United States Navy. His final assignment as a Navy Captain was as Commanding Officer, Engineering Field Activity West, in San Bruno, California where he was responsible for over $200 million in construction activity per year and a wide variety of engineering and facilities services. His 550-person organization provided service to five major active military bases and numerous reserve centers throughout the California, Utah and Nevada areas as well as managed the closed military base conversion program for over a half dozen closed Navy bases in the San Francisco Bay area. He made Navy history by executing the first closed Navy base "Early Transfer" to the allowing the Port of Oakland to take responsibility for the environmental cleanup and place the base into civilian use many years ahead schedule.

Among his many other Navy assignments, Mr. Hunter also served as Deputy Assistant Secretary for the Department of Energy in Washington, DC responsible for the Naval Petroleum and Oil Shale reserve. During this assignment he greatly reduced operating cost and significantly increased revenue for the Elk Hill government oil and gas fields in Bakersfield, California. He also played a major role in the sale of the oil fields generating $3.65 billion for the U.S. treasury. It was also during this assignment when Mr. Hunter cofounded the HBCU intern program which has blossomed into the Mickey Leland Energy Fellowship program.

Mr. Hunter received many awards including the Navy Legion of Merit; the Department of Energy Gold Award; Fort Valley University Platinum Achievement Award; The University of Texas Eyes of Texas Award; and The University of Texas Employees and Campus Services SLICE Award.

His educational background includes a Masters and Bachelors of Electrical Engineering from Texas A&M University and a Masters of Science in National Resource Strategy from the Industrial College of the Armed Forces. He is also a graduate of the APPA Facilities Institute. Mr. Hunter is a registered Associate Computer Professional with the Institute for the Certification of Computer Professionals and a Microsoft Certified Office Specialist at the Expert level.

He is married to Brenda Hunter (Newton) and they have one son, Ernest R. Hunter II, and one daughter, Britney Hunter.

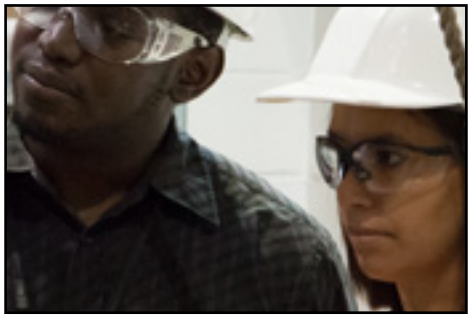
REGINALD "REG" SPILLER

MLEF Program Co-Founder
Former Deputy Assistant Secretary
Department of Energy

Mr. Spiller has over 30 years of oil and gas experience. He began his career with Exxon USA, Elf Aquitaine and Maxus Energy. Previously, he was COO for Allied Energy. All companies were Houston based. Currently he is CEO of Azimuth Investments, and was co-founder of Frontera Resources. At Frontera, he attracted $200 million for an LSE AIM listing, and doubled production in Georgia and Azerbaijan to 6000 bbls p/d within 16 months. Advisory boards he served on include: the National Academy of Science, the Penn State College of Earth and Mineral Science, the University of Utah Energy Geoscience Institute, and the National Association of Black Geologists and Geophysicists. From December '93 to March, '96, Mr. Spiller was the U.S. Department of Energy's Deputy Assistant Secretary for Gas and Petroleum Technologies, the highest-ranking geologist in the administration and first petroleum geologist to hold the position. He was recently appointed Honorary Consul General to Sierra Leone. Mr. Spiller holds a M.S. in Geology from Penn State University, is a recipient of the Distinguished Alumni Aware, and a B.A.S.S. from the State University of New York in Geology.

2014 INTERNS

George Adesanya
Thalia Aoki
Ella Baar
Melanie Bailey
LaDena Bolton
Carolyn Brown
Kyle Bucheit
Jared Carpenter
Zachary Cesaro
George Chacko
Ariana Clements
Conrad Cole
Laura Dalton
Jaffer Deane
Emily Drastata
Melissa Emerson
Anastasia Fries
Lydia George
Louise Gutierrez
Leah Haling
Allante Harrison
Mackenzie Harrman
Benjamin Heinle
Victor Huayamave
Virginia Jiminez
Emma Johnson
Colton King
Ashley LeDonne
Charlotte Metzger
Abhilash Nair
Decie Odom
Nelson Olofindayo
Alex Pritchett
Soheil Razmyar
Leticia Rojas
Camilla Schramek
Annie Sheppard
Andrew Sisler
Matthew Stadelman
Siobhan Tarver
Jamie Trindell
Dominique Williams
Julia Wittkamper
Regina Woloshon



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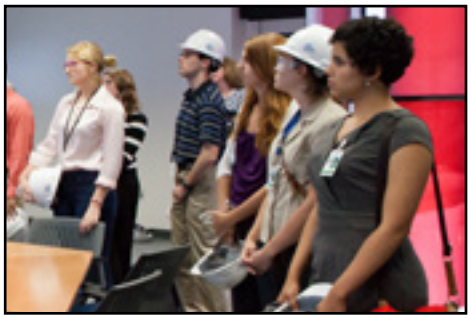


GEORGE ADESANYA

Senior

Major: Economics, Geology & Geophysics

Yale University, New Haven, CT

Mentor: Jose Benitez

BIOGRAPHY

George Adesanya attends Yale University in New Haven, Connecticut where he is earning a BA in Economics and a BA in Geology and Geophysics. While his interests range from resource economics to geochemistry, his primary academic interests lie with energy, where he has sought to use an interdisciplinary approach to address relevant issues. His favorite academic experience has been a graduate-level course that studied and analyzed urban and rural energy systems around the world, with an emphasis on identifying and solving various energy and emissions-related problems. George intends to write his Geology senior thesis on enhanced oil recovery (EOR) methods – their history, technological innovation, and environmental impacts. His Economics senior thesis will likely cover a similar topic, and will take form of benefit-cost analyses of the different methods. George will graduate in the spring of 2015 and looks to enter a graduate program in resource economics or environmental management.

In the future George hopes to extend his academic interests into a career, working with energy microfinance projects or designing zero-energy homes and buildings. George enjoys traveling and would like to visit and/or live in Australia, New Zealand and Iceland.

PROJECT	NEMS OIL AND GAS FORECASTING
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

George worked on NEMS (National Energy Modeling System), an economic and energy model of the United States energy markets created by the Department of Energy. George worked on process type curves within the Oil and Gas Supply Module (OGSM) of NEMS, forecasting technically recoverable oil and gas from reservoirs in the US.

MENTOR

Jose Benitez is an energy analyst within the Office of Program Planning and Benefits at NETL, and is located in Pittsburgh, Pa. He is a graduate of Rensselaer Polytechnic Institute where he earned a Bachelor's degree in Mechanical Engineering. Also, he is a Fourth Year Evening Law student and Duquesne University where he is pursuing a Juris Doctor. He is a Licensed Professional Engineer.

THALIA AOKI

Senior

Major: Environmental Engineering

Cornell University, Ithaca, NY

Mentor: Dustin Crandall

BIOGRAPHY

Thalia Aoki attends Cornell University in Ithaca, NY, where she is earning her BS in Environmental Engineering. As an undergraduate researcher at the school under Dr. Aristilde, she studies the effects of organics on soil health through chemical modeling. She formerly conducted research on sustainable drinking water treatment as part of Dr. Weber-Shirk's AguaClara project. She has been an undergraduate teaching assistant for four classes, offered through Cornell's Biological and Environmental Engineering, Civil and Environmental Engineering, and Computer Science Departments. Thalia will graduate in the spring of 2015, and plans on attaining her masters in Environmental Engineering at Cornell.

PROJECT	GRAPHICAL DETERMINATION OF POROSITY, SATURATION, AND RELATIVE PERMEABILITY FROM DISPLACEMENT EXPERIMENTS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Ms. Aoki worked on image processing algorithms to provide quantitative data extraction from computed tomography scans of fluid flow within rock fractures. These scans are used to research the effects of surfactants used in energy extraction (e.g. in such applications as hydraulic fracturing), but previously only qualitative assessments could be made based on the images alone. Now these images can be processed to provide accurate, dynamic assessments of fluid saturation levels as well as material properties of the fractures under experimental conditions.

MENTOR

Dustin Crandall is a research engineer at the National Energy Technology Laboratory in Morgantown West Virginia. He graduated from Clarkson University with a BS, ME, and PhD in Mechanical Engineering, working with researchers at NETL on his dissertation "Two Phase Flow in Porous Media and Fractures". Following graduation Dustin was awarded a two year postdoctoral fellowship by the National Research Council evaluating multiphase transport in fractures. Since the post-doc his primary research activities have focused on simulation related to, and experimental analysis of, computed tomography derived flow in fractured geologic media, with 15 peer reviewed publications and multiple conference presentations on the topic.

ELLA BAAR

Senior

Major: Biological Engineering

University of Florida, Gainesville, FL

Mentor: Regis Conrad

BIOGRAPHY

Ella Baar attends University of Florida in Gainesville, where she is earning her BS in Biological Engineering. She participated in undergraduate research at the University of Florida under Dr. Jeffrey Ullman, looking at ways to decrease antibiotic resistant bacteria in the environment. Previously Ella participated in a NSF funded internship where she traveled to India for the summer to conduct a water management project on rural, agricultural wells. Ella will graduate in the fall of 2014 and plans on attaining a master's degree from the University of Florida. Ms. Baar's career aspirations include working on environmental issues either within the public or private sectors.

PROJECT	WATER USAGE IN POWER GENERATION
SITE	GERMANTOWN, MD

The energy sector is the largest user of water and behind agriculture is the second largest consumer of water. Because of this fact and the increase of extreme weather around the U.S. the water-energy link is gaining more attention. Ms. Baar worked with the Water-Energy Tech Team (WETT) to promote its goals to reduce water use in thermoelectric power generation plants. To fulfill the goals of WETT Ella conducted research on cooling of thermoelectric plants and worked to develop a request for information on the topic. She also was involved with the finalization of public documents on the water-energy nexus.

MENTOR

Regis Conrad has worked in electrochemistry and materials engineering since 1978. Currently Mr. Conrad manages the research on sensor and control, computational modeling and high temperature materials research. Prior to working for the Department of Energy he worked for the Department of Navy as a materials engineer. Mr. Conrad has a B.A. in Chemistry and Zoology from George Washington University.

MELANIE BAILEY

Junior

Major: Animal Science

Minor: Chemistry

Texas Tech University, Lubbock, TX

Associate of Arts, 2013

Western Texas College

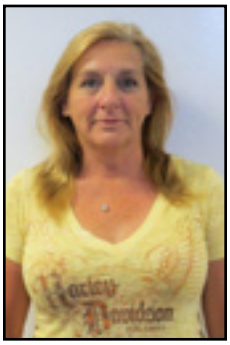
Mentor: Angela Coale & Jimmy Salinas

BIOGRAPHY

Melanie Bailey is currently a junior studying Animal Science at Texas Tech University. She has an Associate's Degree in General Studies from Western Texas College (WTC), where she was a collegiate softball athlete. Shortly after her one year at WTC, she continued softball for a short period of time as a Texas Tech Red Raider, and now focuses solely on what the future holds. At this time, Melanie is interested in the pre-veterinary route. You can find Melanie taking time to visit with loved ones and being outdoors. She is extremely grateful to the MLEF for presenting her with the incredible opportunity to help on a project for which she has so much passion.

PROJECT	DEVELOPMENT OF ZERO-WASTER PRACTICES AND GOALS
SITE	STRATEGIC PETROLEUM RESERVE (SPR) SITES; BRYAN MOUND SITE, FREEPORT, TX

Zero-Waste is a theory in which all waste is reused or repurposed. Its overall goal is to send nothing to landfills. Currently, waste is a constantly overlooked problem which further creates a dint in our ecosystems, wildlife, and extent of human life. Everyday waste emits gases that are a hazard to health, contamination of our water supply, and slow eliminator of our land. The achievement of the Zero-Waste strategy allows a site to realize a reduction in liability and costs associated with the generation of wastes. The current waste management practices of the United States Department of Energy's SPR sites were studied for this project. Costs and resource requirements for these programs were highly evaluated, and site visits were completed to see firsthand how waste is handled at each site The Zero-Waste concepts practiced by other agencies and industries were explored; and certain SPR byproduct streams were targeted for innovative waste-reduction projects. This information was presented to provide direction towards reaching a Zero-Waste status.



MENTOR

Angela Coale holds the position of Senior Quality Assurance Specialist and Behavioral Safety Consultant for Fluor Federal Petroleum Operations LLC, a prime contractor for the Department of Energy's Strategic Petroleum Reserve, and is located in Freeport, TX at the Bryan Mound site. She has worked in Quality Assurance for almost 4 years and was previously an Instrumentation/Electrician Technician for 23 years. She is a graduate of Brazosport College's Instrumentation Vocational School. She is a member of the BM Voluntary protection Program Committee, Employee Activity Committee, United Way Representative, and the Behavioral Safety Steering Committee. She has been a Licensed Internal Consultant for the Behavioral Safety Processes across the SPR since 1997.

LADENA A. BOLTON

Doctor of Philosophy graduate May 2014

Major: Polymer Chemistry

Minor: Materials Science

Clark Atlanta University, Atlanta, GA

Bachelor of Science, 2006

Savannah State University

Mentor: Kyle Alvine, Ph.D.

BIOGRAPHY

LaDena A. Bolton attended Clark Atlanta University (CAU) in Atlanta, GA, where she earned her Ph.D. in Polymer Chemistry. She participated in graduate research in CAU'S CREST Center for Functional Nanoscale Materials under Dr. Ishrat Khan, conducting fundamental studies on the effects of stereochemistry on nanocomposite physico-chemical properties, and investigated them as drug delivery vehicles. Dr. Bolton graduated in the spring of 2014 and accepted a Postdoctoral Fellowship in the School of Medicine at Emory University.

Mrs. Bolton's career aspirations include working at the DOE studying sustainable energy and engaging in science policy at the local and national levels. LaDena enjoys traveling and would like to visit all 7 continents. Her biggest goal is to develop a 'disruptive technology' which encourages more students to enthusiastically engage in STEM education.

PROJECT | FABRICATION OF SUBWAVELENGTH WINDOW COATING APPLICATIONS

SITE | PACIFIC NORTHWEST NATIONAL LABORATORY, RICHLAND, WA

Dr. Bolton investigated the preparation of subwavelength window coatings in order to establish 'proof-of-concept' for the development of a novel, scalable fabrication process. These subwavelength films could potentially be used as energy efficient window coatings to tailor the transmission and distribution of light through the window. Such technologies could contribute to the 'smart grid' by reducing the amount of energy used during peak hours, thus, advancing sustainability.

MENTOR

Dr. Alvine is a senior research scientist at the Pacific Northwest National Laboratory in Richland, WA. He received his Ph.D. from Harvard University in applied physics in 2006 in the field of nanoscale wetting and nanoparticle self-assembly. Prior to joining PNNL in 2008, he was a National Research Council Postdoctoral Fellow in the polymers division of the National Institute of Standards and Technology in Gaithersburg, MD working on advancing the state of the art in Nanoimprint Lithography. He is currently working on several projects involving nano-based material development for energy applications.

CAROLYN BROWN

2nd-Year Graduate Student

Major: Geology

University of Arkansas Fayetteville, Arkansas

Bachelor of Science, Geology 2013

University of Arkansas

Mentor: Gabby Intihar

BIOGRAPHY

Carolyn Brown attends the University of Arkansas in Fayetteville, where she is earning her MS in Geology. She also obtained her BS from the University of Arkansas in Geology in 2013. Carolyn will graduate in the spring of 2015 with her research focused on the hydrology of a hydrocarbon reservoir consisting of tripolitic chert in Osage County, Oklahoma.

Ms. Brown's career aspirations include working for the energy sector, whether it is private or government. She eventually would like to focus mainly on the sustainability and environmental stability of petroleum exploration and production. Her biggest goal is to help plan and implement strategies that enable the energy industry to perform alongside nature and the public in a complementary amalgamation. In her spare time, Carolyn enjoys drawing portraits with chalk pastels and traveling, hoping to someday visit New Zealand and The Netherlands.

PROJECT	AN INTEGRATED LOOK INTO UNCONVENTIONAL OIL AND NATURAL GAS IMPACTS ON WATER QUALITY AND AVAILABILITY FOR REMEDIATION AND MITIGATION RESEARCH AND TECHNOLOGY
SITE	OFFICE OF FOSSIL ENERGY, FORRESTAL, WASHINGTON DC

Carolyn has been organizing and developing storylines to explain the various research and development projects, concerning the remediation and mitigation issues associated with water quality and availability, due to unconventional oil and gas ventures. The research and development projects are being carried out by multiple entities, such as, the National Energy Technology Laboratory (NETL), private companies, and universities across the United States. The process incorporated reading through all of the final project technical reports and/or fact sheets to determine what the accomplishments and strategies were, then creating a story to explain what had been done, in non-technical terms, for most to understand. However, a crucial point is that the storylines explain how the projects directly contributed to the key science needs established through a Multi-Agency Collaboration between the Department of Energy (DOE), the Department of the Interior (DOI), and the Environmental Protection Agency (EPA). Two final deliverables, consisting of the storylines and a power point presentation that clearly and eloquently explain these projects are expected, along with the final report and presentation for the Mickey Leland forum.

MENTOR

Gabby Intihar is a Senior Program Analyst for the Office of the Deputy Assistant Secretary for Oil and Natural Gas. Gabby manages the budget and strategic processes for the Office of Oil and Natural Gas. Gabby assists program managers in their planning activities with internal and external groups and promotes annual and long-term planning efforts between Headquarters and NETL staff. Gabby manages the development and reporting of program performance, including benefits. Gabby initiated and led the DOE-wide Performance Improvement Initiative and Performance Measures Streamlining Initiative when working for the CFO/PA&E.

KYLE LEE BUCHHEIT

4th Year Ph.D. Student

Ph.D. Chemical Engineering

Missouri University of Science & Technology, Rolla, Missouri

M.S. Applied Mathematics – 2013, Missouri S&T
B.S. Chemical Engineering – 2010, Missouri S&T
B.A. Economics – 2010, Missouri S&T

Mentor: Dirk Van Essendelft

BIOGRAPHY

Kyle Buchheit attends the Missouri University of Science and Technology in Rolla, where he is earning is Ph.D. in Chemical Engineering. He had conducted undergraduate research performing dynamic contact angle analysis between oil and brine for use in enhanced oil recovery. He has also performed graduate research in molecular dynamics, investigating water interaction with ligands in hydrogels. His current Ph.D. work involves the modeling of a coal, wind, and small modular nuclear reactor hybrid energy system. Kyle plans to graduate in December of 2014.

The future Dr. Buchheit plans on becoming a chemical process modeler and simulator in the public sector. He would like to begin doing research at national labs, then perhaps later returning to academia and becoming a professor.

PROJECT	DEVELOPMENT AND APPLICATION OF ADVANCED COMPUTER LEARNING TECHNIQUES TO IMPROVE CHEMICAL REACTION MODELING WITHIN MULTI-PHASE CFD
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Mr. Buchheit worked on simulating chemical reactions inside of multi-phase flows utilizing computational fluid dynamics software. His work helped validate the reaction kinetics output by various models in the Carbonaceous Chemistry for Computational Modeling (C3M) software by testing cases in ANSYS's Fluent and NETL's MFiX CFD software alongside experimental studies in literature. This work will lead to a more adaptive program capable of producing more rigorous and accurate chemical reaction kinetics for use with CFD.

MENTOR

Dirk Van Essendelft is the principle investigator for the Carbonaceous Chemistry for Computational Modeling (C3M) program at the Department of Energy's National Energy Technology Laboratory. He earned a Bachelor's degree in Chemical Engineering from Calvin College in 2003, a Master's Degree in Chemical and Biochemical Engineering from the University of California, Irvine in 2005, and a Ph.D. in Energy and Geo-Environmental Engineering in 2008. During and shortly after his doctorate, he founded a small business, Carbon Trap Technologies, and served as the Chief Technology Officer. The company developed processes to sequester carbon dioxide from large power plants. Following that venture, he took a position at the National Energy Technology Laboratory in Morgantown, WV and now develops C3M, a chemistry management software program.

JARED CARPENTER

3rd Year

Major: Mechanical Engineering

University of Tennessee, Knoxville

Mentor: Dr. Ronald Breault

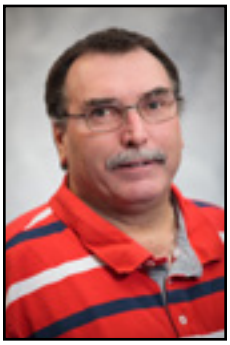
BIOGRAPHY

Jared Carpenter attends the University of Tennessee in Knoxville, where he is studying Mechanical Engineering. The Mickey Leland Energy Fellowship Program is his first research opportunity/internship. Jared plans to graduate in 2017 with both his Bachelor's and Master's degree with the University of Tennessee's 5-year MS-BS program.

Jared's career aspirations include earning his doctorate, and eventually going into research. He's not entirely sure what specifically he wants to go into, so he's hoping experiences like this one can guide him.

PROJECT	ANALYSIS OF THE OXIDATION REACTIONS OF CHEMICAL LOOPING
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Mr. Carpenter is working on analyzing the oxidation reaction data from the chemical looping process. Chemical looping is a process where you have an oxygen carrying material (normally a metal oxide) and you flow a fuel through it (in this case, methane gas) to produce carbon dioxide and water in such a way that the carbon dioxide is easy to separate and capture. However, doing this depletes the oxygen in the oxide, so the depleted oxides are sent to an oxidation chamber, where normal air is streamed through the oxide to replenish its oxygen so it can be used again in the chemical looping process. Jared is analyzing the rate oxygen is entering and leaving the chamber, and modeling that data to a known equation.



MENTOR

Dr. Breault has over thirty years of experience in the energy and transport fields and is presently the Reactor and Process Development Team Lead within the Energy Process Innovation Division of the Office of Research and Development at a the US DOE's National Energy Technology Laboratory. Presently, he leads a team focused on the development of chemical looping combustion. He received his Ph. D. and M.S. in Chemical Engineering from the University of New Hampshire and a B.S. in Chemical Engineering from Clarkson University. Prior to joining the department of energy, he was Director of Environmental Technologies Division within a subsidiary of Thermo Electron. At Thermo he managed programs on the development of the copper oxide process, a corona based NOx control process, hydrogen production and storage programs as well as programs on gasification, combustion, emissions control and heat recovery. Prior to his tenure at Thermo he was a senior engineer at Riley Stoker Corporation and technical leader of fluidized bed technology development. Dr. Breault is has been the US DOEs representative and chair to the IEA Mutiphase Flow Implementing Agreement. He has numerous publications on multiphase flow dating back to 1985.

ZACHARY CESARO

Class of 2016

Major: Chemical Engineering

Business Minor

Cornell University, Ithaca NY

Mentor: Todd H. Gardner

BIOGRAPHY

Zac Cesaro attends Cornell University in Ithaca NY, where he is earning his BS in Chemical Engineering. He participated in undergraduate research at the school under Dr. Paul Steen, studying planar flow casting and X-ray Diffraction of amorphous (glassy) metals. Zac is also a member of the Varsity Men's Swimming and Diving team at Cornell. Zac will graduate in the spring of 2016.

Zac's career aspirations include working in the energy industry on projects that emphasize sustainability and renewability. His biggest goal is to help advance the global scientific community by implementing new technologies in revolutionary ways. Zac's primary focuses are helping society and protecting the environment.

PROJECT	SYNTHESIS AND ANALYSIS OF NICKEL NANOPARTICLE CATALYSTS USED FOR NATURAL GAS TRANSFORMATIONS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Zac's work is focused on nickel nanoparticles that are used as catalysts in reactors that transform natural gas into syngas. The overall goal of this project is to develop technology that will eliminate the current flaring that occurs internationally during oil extraction and production processes. A significant quantity of natural gas is flared annually because it cannot be economically stored or transported, however syngas can be. Zac's work is primarily focused on characterizing how these nanoparticle catalysts are synthesized and grow, as well as how they perform.

MENTOR

At the National Energy Technology Laboratory (NETL), Dr. Todd Gardner is a Research Chemical Engineer with over 20 years of experience and a background in chemical reaction engineering, catalysis and materials science and interests in the development and application of heterogeneous catalysis and nanomaterials to energy, chemicals and advanced fuels production. His recent research focuses on the efficient conversion of natural gas to synfuels and the chemical transformation of carbon dioxide greenhouse gases into high volume chemicals. Dr. Gardner received his Ph.D. and M.S. in Chemical Engineering from West Virginia University, preceded by a B.S. in Chemical Engineering from the Florida State University. He recently received the Office of Fossil Energy's Lean Six Sigma green belt certification. Since 2010, Dr. Gardner has served as a Judge for the R&D100 awards, as Program co-Chair for the ACS Division of Energy and Fuels, as Program Chair for the ACS Division of Petroleum Chemistry, as Chair of the Pittsburgh Section of AIChE, and as Chair of the Northern West Virginia Section of the ACS. He has also organized numerous technical symposia and has chaired the ACS George A. Olah Award Committee in Hydrocarbon or Petroleum Chemistry. Throughout his career he has authored and co-authored numerous technical publications.

GEORGE CHACKO

Senior

Major: Energy, Business, and Finance

Minor: Economics

Pennsylvania State University, State College, PA

Mentor: Regis Conrad

BIOGRAPHY

George Chacko attends the Pennsylvania State University, where he is earning his BS in Energy, Business, and Finance, with a minor in Economics. George will graduate in the spring of 2015 and plans on working in the energy industry focusing on energy finance or energy private equity.

George is a member of the Energy, Business, and Finance Society along with Club Tennis at Penn State.

Currently, George is going into his final year as an undergraduate and plans on fully utilizing his degree in the energy industry and contributing to the pursuit for a more secure energy future. Mr. Chacko's career aspirations include working for Siemens Energy, or Goldman Sachs Alternative Energy Group. After obtaining valuable work experience in the private sector, George plans on returning to a well-accredited university in order to get his Master's in Business Administration (MBA).

PROJECT	ECONOMIC ANALYSIS OF RARE EARTH ORES
SITE	GERMANTOWN, MD

This summer, Mr. Chacko will be working alongside Dr. Peter Rozelle in conducting a cost-benefit analysis and constructing a set of financial statements to assess the economic viability of recovering rare earth ores as by-products of coal production. Rare earths are extremely essential to the North American economy and are utilized in a variety of markets today. The cost-benefit analysis relies on the addition of positive and the subtraction of negative factors to determine a net result. Along with rare earths as his main project, George will be conducting various other research activities this summer at the DOE.

MENTOR

Regis Conrad has worked in electrochemistry and materials engineering since 1978. Currently Mr. Conrad manages the research on sensor and control, computational modeling and high temperature materials research. Prior to working for the Department of Energy he worked for the Department of Navy as a materials engineer. Mr. Conrad has a B.A. in Chemistry and Zoology from George Washington University.

ARIANA CLEMENTS

Senior

Major: Chemical Engineering

Minor: Pharmaceutical Science

University of Rhode Island Kingston, RI

Mentor: Justin Weber

BIOGRAPHY

Ariana Clements attends the University of Rhode Island (URI) where she is earning her BS in Chemical Engineering with a specialty in Pharmaceutical Science. She participated in undergraduate research at URI under Dr. Lucia, studying cubic equations of state and multi-phase equilibrium. Ariana will graduate in the spring of 2015 and plans on pursuing a career in chemical engineering.

Ms. Clements' aspires to work in the pharmaceutical industry. She hopes to ultimately utilize her skills and passion for knowledge to improve the lives of people all over the world especially those suffering from illness.

PROJECT	FLOW OF PARTICLES IN THE CHEMICAL LOOPING PROCESS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Ms. Clements worked on L-Valve Velocity Imaging to better understand the way particles move through an L-Valve. The process involved taking videos while flashing HDPE particles moving through an L-Valve and collaborating on a Python code to analyze the videos and extract the velocity. She also conducted an experiment to better understand transport disengagement heights in fluidized beds. This data was then compared to correlations found in literature. In addition Ariana created a GUI in Python to calculate these correlations for various particles. Now researchers can easily obtain an estimate for information such as minimum fluidization before conducting an experiment.

MENTOR

Justin Weber is General Engineer at Department of Energy's National Energy Technology Laboratory located in Morgantown, WV. He is a graduate of The Pennsylvania State University where he earned a Bachelor's degree in Mechanical Engineering. He performs research in the area of advanced fossil fuel energy systems including chemical looping combustion, electrical capacitance volume tomography, multiphase flow, computational fluid dynamics, and Python. Justin was introduced to the Department of Energy through a similar internship program back in 2007.

CONRAD COLE

May 2014

M.S. Mechanical Engineering

University of Florida, Gainesville, FL

B.S. Mechanical Engineering, 2010

University of Central Florida

Mentor: David Tucker

BIOGRAPHY

Conrad Cole recently earned his M.S. in Mechanical Engineering at the University of Florida along with a graduate certificate in Energy Management. He performed research in the Bioprocess Engineering laboratory under Dr. Pratap Pullammanappallil during his Master's studies at the university. Conrad plans to pursue a PhD in Mechanical Engineering starting Fall 2014 also at the University of Florida. His research will be centered on Solar Thermochemical Energy Storage which is a multi-disciplinary topic involving diffusion kinetics, molecular thermodynamics and high temperature reactor design.

Mr. Cole has geared his career toward Renewable Energy Technology; he is particularly dedicated to and passionate about this field. After completing his doctoral degree Mr. Cole plans to continue research as a postdoctoral associate at a university or national laboratory. He is also interested in technology commercialization through start-up ventures. His long-term career interests include the development of Sierra Leone, his nation of birth by implementing educational programs in science, engineering and energy technology.

PROJECT	HYBRID PERFORMANCE PROJECT (HYPER)
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Mr. Cole analyzed the effects of load transients on a solid oxide fuel cell gas turbine hybrid system. These transient phenomena include dynamics in fuel composition, electrochemical potential, oxidant/fuel flow rates, and thermal transients. Comprehending the system's response to these effects is critical to achieving optimal cycle performance, maximizing efficiency as well as ensuring secure operation of the discrete components.

MENTOR

Dr. David Tucker is the project leader and principle investigator for the Hybrid Performance (Hyper) project at the U.S. Department of Energy, National Energy Technology Laboratory (NETL). His prior research experience includes system integration and controls development for advanced power systems, fuel cell turbine hybrid power, solid oxide fuel cell cathode development, coal structure and catalytic liquefaction, flash pyrolysis of lignite and biomass, and heterogeneous catalysis in gasification. Previous to his employment at NETL, Dr. Tucker had a diverse career in academia and industry, working as a university professor, a managing director of a public company, a lead engineer, a refractory specialist, a carpenter, and a ditch digger.

LAURA DALTON

2015

Major: Civil Engineering

West Virginia University, Morgantown, WV

Bachelor of Arts in Graphic Design, 2012

Mathematics Minor

West Virginia Wesleyan College

Mentor: Eilis Rosenbaum

BIOGRAPHY

Laura Dalton attends West Virginia University, where she is earning her BS in Civil Engineering. She is vice president of the WVU American Society of Civil Engineers (ASCE) student chapter where she is a member of both the Concrete Canoe and Steel Bridge teams. Laura will graduate in the spring of 2015 and plans on attaining her masters in Civil Engineering at West Virginia University.

Ms. Dalton's career aspirations include working in building material research or structures. Her biggest goal is to help progress energy efficient building materials and find ways to incorporate these resources into pre-existing structures.

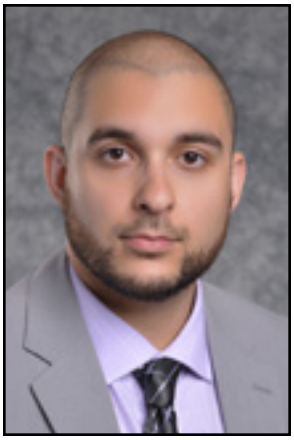
PROJECT RHEOLOGICAL PROPERTIES OF FOAMED CEMENT

SITE NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Ms. Dalton worked on methods that will enable us to determine the rheology of foamed cement. This experimental research provided knowledge on average bubble size, bubble distribution, and cement properties during imposed shear flow. The data extracted from the viscometer will be used to determine the relative viscosity and other rheological properties of the laboratory foam cement. The CT scans of laboratory foam cement samples were used to generate a 3-D model of the bubble distribution and used to simulate a foamed cement mixture and the relative viscosity of the mixture to compare to experimental results. Now, these results can be used to find better ways to formulate foamed cement for real-life applications and give a better understanding of foamed cement properties. Achieving evenly distributed slurries can progress the safety and applications of foamed cement throughout the industry.

MENTOR

Eilis Rosenbaum is a research engineer in the Materials Characterization Division within the Office of Research and Development at NETL, Pittsburgh, PA. She is a current PhD candidate in the Civil Engineering Department at Carnegie Mellon University. She earned her Master of Science in Chemical Engineering at the University of Pittsburgh and her Bachelor of Science in Engineering concentration in Mechanical Engineering and Bachelor of Science Degree in Chemical Engineering with a minor in Mathematics from Geneva College. Her research at NETL has included work in methane hydrates, thermal properties, computer tomography (CT) scanning, CT image analysis, and work in quality control and safety. Her current research and interest is with foamed cements and modeling its behavior under well bore conditions.



JAFFER T. DEANE

Senior

Major: B.S. Petroleum Engineering

Minor: Mathematics

University of North Dakota, Grand Forks, ND

Mentor: Gabby Intihar

BIOGRAPHY

Jaffer Deane is currently an undergraduate student at the University of North Dakota and is finishing his BS in Petroleum Engineering and Mathematics. He serves as the Vice President for the North Dakota Society of Petroleum Engineers chapter. Jaffer will be attending the SPE Annual Technical Conference and Exhibition in Amsterdam, The Netherlands this fall to compete in the global PetroBowl 2014 competition.

Mr. Deane aspires to work for companies such as ExxonMobil, Chevron, or Royal Dutch Shell in the oil and gas industry. He seeks to work internationally and contribute to society on a global scale. Jaffer is passionate about the energy industry, and seeks to use his skills to advance oil and gas technology and practices. Mr. Deane also plans to attend graduate school to attain an MS in Petroleum Engineering.

PROJECT	UNCONVENTIONAL RESOURCES RESEARCH AND DEVELOPMENT PORTFOLIO ANALYSIS-CHARACTERIZATION AND MANAGEMENT
SITE	OFFICE OF FOSSIL ENERGY, FORRESTAL, WASHINGTON DC

Mr. Deane worked to build a comprehensive methodology to evaluate the Unconventional Resources research and development profile for the Office of Oil and Natural Gas. He analyzed the projects and incorporated them into a storyline to be utilized and developed by the DOE. Jaffer focused on the 'Resource Characterization and Management' area of the unconventional oil and gas research and determined the degree to which the accomplishments of these projects fit into the multiagency collaboration and strategic plan of the DOE.

MENTOR

Gabby Intihar is a Senior Program Analyst for the Office of the Deputy Assistant Secretary for Oil and Natural Gas. Gabby manages the budget and strategic processes for the Office of Oil and Natural Gas. Gabby assists program managers in their planning activities with internal and external groups and promotes annual and long-term planning efforts between Headquarters and NETL staff. Gabby manages the development and reporting of program performance, including benefits. Gabby initiated and led the DOE-wide Performance Improvement Initiative and Performance Measures Streamlining Initiative when working for the CFO/PA&E.

EMILY DRASTATA

Junior

Major: Environmental Geosciences

Minor: Geography

Texas A&M University, College Station, TX

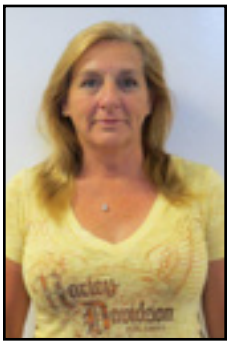
Mentor: Angela Coale & Jimmy Salinas

BIOGRAPHY

Emily Drastata attends Texas A&M University, where she is earning her Bachelor of Science in Environmental Geosciences with an emphasis on Human Impact on the Environment. She is currently on the Dean's List and has been honored with the title of Distinguished Student. Emily serves as an ambassador for Texas A&M's Association of Former Students as well as being a member of the Undergraduate Recruitment Team for the College of Geosciences. Emily loves to explore the natural world. She particularly enjoyed studying abroad in Costa Rica and Nicaragua last summer. After graduation, she intends to pursue a Master's Degree in Environmental Planning.

PROJECT	DEVELOPMENT OF ZERO-WASTE PRACTICES
SITE	STRATEGIC PETROLEUM RESERVE (SPR) SITES; BRYAN MOUND SITE, FREEPORT, TX

Zero-Waste is a theory in which all waste is reused or repurposed. Its overall goal is to send nothing to landfills. Currently, waste is a constantly overlooked problem which further creates a dint in our ecosystems, wildlife, and extent of human life. Everyday waste emits gases that are a hazard to health, contamination of our water supply, and slow eliminator of our land. The achievement of the Zero-Waste strategy allows a site to realize a reduction in liability and costs associated with the generation of wastes. The current waste management practices of the United States Department of Energy's SPR sites were studied for this project. Costs and resource requirements for these programs were highly evaluated, and site visits were completed to see firsthand how waste is handled at each site The Zero-Waste concepts practiced by other agencies and industries were explored; and certain SPR byproduct streams were targeted for innovative waste-reduction projects. This information was presented to provide direction towards reaching a Zero-Waste status.



MENTOR

Angela Coale holds the position of Senior Quality Assurance Specialist and Behavioral Safety Consultant for Fluor Federal Petroleum Operations LLC, a prime contractor for the Department of Energy's Strategic Petroleum Reserve, and is located in Freeport, TX at the Bryan Mound site. She has worked in Quality Assurance for almost 4 years and was previously an Instrumentation/Electrician Technician for 23 years. She is a graduate of Brazosport College's Instrumentation Vocational School. She is a member of the BM Voluntary protection Program Committee, Employee Activity Committee, United Way Representative, and the Behavioral Safety Steering Committee. She has been a Licensed Internal Consultant for the Behavioral Safety Processes across the SPR since 1997.

MELISSA EMERSON

Senior

Major: Chemical Engineering, Sustainable Energy and Environmental Engineering Concentration

Minor: Business Administration

North Carolina State University, Raleigh, NC

Mentor: David C. Miller

BIOGRAPHY

Melissa Emerson attends North Carolina State University in Raleigh, where she is earning her BS in Chemical Engineering with a concentration in Sustainable Energy and Environmental Engineering and a minor in Business Administration. She participated in undergraduate research with one of the Chemical Engineering professors at NC State, Dr. Steven Peretti, where she worked on developing new techniques for cultivating algae to be used in the production of biofuels. In the spring of 2013 she spent a semester studying abroad at the University of Cape Town in South Africa. She also spent ten days in Iceland this past March doing research on sustainable energy at the University of Reykjavik. Melissa will graduate in the spring of 2015.

Ms. Emerson's career aspirations are to work for an environmental firm on environmental cleanups or to help develop sustainable energy technology. Melissa enjoys anything outdoors and traveling, and she hopes to visit every continent within the next ten years. Her biggest goal is to help to integrate environmental protection with developing technology to help create a greener society.

PROJECT	CARBON CAPTURE SIMULATION INITIATIVE
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

Ms. Emerson worked on the Carbon Capture Simulation Initiative project where she developed a plugin for the program FOQUS, which is a simulation program designed to give the energy and cost values of implementing carbon capture technology into industry coal plants. This plugin is designed to zero in on noisy parts of the simulation and take more data points to get more accurate results from the algebraic guesses that the program makes. This plugin will help make the program more accurate as it is scaled up to full scale power plant simulations.

MENTOR

David Miller earned his Ph.D. in Chemical Engineering at The Ohio State University in 1998. Following a decade in academia, Dr. Miller joined the U.S. Department of Energy's National Energy Technology Laboratory where he currently leads the Carbon Capture Simulation Initiative (CCSI), a consortium to develop, demonstrate and deploy computational tools and models to accelerate the development of carbon capture technology. Within CCSI, Dr. Miller is responsible leading research teams across five U.S. National Laboratories (Los Alamos, Lawrence Berkeley, Lawrence Livermore, and Pacific Northwest) and five universities (Carnegie Mellon University, West Virginia University, Princeton University, Boston University, and University of Texas). Dr. Miller's research interests include process synthesis, integration, and optimization of energy systems and issues associated with the energy-water nexus.

ANASTASIA FRIES

Undergraduate Senior

Major: Geology and Environmental Science

La Salle University, Philadelphia, PA

Mentor: Daniel J. Soeder

BIOGRAPHY

Anastasia Fries attends La Salle University in Philadelphia, where she is earning her BS in geology and environmental science. Along with her studies, she is a member of the women's lacrosse team. Anastasia will graduate in the spring of 2015 and plans on attaining her masters in geology.

Anastasia's career aspirations include starting out in the field, finding her niche in the subject, and then pursuing her doctorate degree. She eventually wants to become a college professor. Anastasia enjoys exploring and would like to visit multiple national parks across the nation. Her biggest goal is to encourage the use of renewable energy sources and inspire the general public to become more aware of the world in which they live.

PROJECT	THE HYDROLOGIC IMPACTS OF SHALE GAS DRILL PADS ON SMALL WATERSHEDS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Anastasia worked with the HEC-HMS water modeling program to create a model of current and future conditions of a drill site. This site is located in the Moshannon State Forest in Central Pennsylvania and will have a shale gas well pad constructed within the next three years. In her project, Anastasia collected data for the current conditions of the site by researching and taking on-site measurements. She then compared this model to estimated future conditions to demonstrate the hydrologic impacts of the well pad on the Gifford Run watershed. This information will be a stepping stone to further investigation of these impacts and provide statistical information on hydraulic fracturing practices.

MENTOR

Dan Soeder is a research scientist and the focus area coordinator for water resources with the U.S. Department of Energy (DOE) in the Office of Research and Development at the National Energy Technology Laboratory, Morgantown, West Virginia. Before transferring to DOE in July 2009, Mr. Soeder was a hydrologist at the U.S. Geological Survey (USGS) Water Science Center in Baltimore, investigating the water resources of Maryland, Delaware and the District of Columbia. His research focused on groundwater supply, water quality, coastal hydrology and tidal wetlands, and included 3 years of service as chair of the Delaware Estuary Program Science and Technical Advisory Committee (STAC). From 1990 to 1998, he worked on the DOE Yucca Mountain Project in southern Nevada as the USGS field coordinator and liaison with DOE for geological and hydrological site characterization studies at a proposed high-level nuclear waste repository. These included geophysical data collection, drilling, coring, geologic mapping, aquifer testing and water quality sampling. Before joining the USGS in 1991, he carried out research on unconventional natural gas resources, such as coal bed methane, tight gas sands, and eastern gas shale at the Institute of Gas Technology (now GTI) in Chicago. Mr. Soeder worked as a contractor for DOE in Morgantown, WV from 1979-1981, where he collected and characterized drill cores on the Eastern Gas Shales Project.

LYDIA GEORGE

Senior

Major: Chemical Engineering

University of Oklahoma, Norman, OK

Mentor: Dushyant Shekhawat

BIOGRAPHY

Lydia George is earning a BA in Chemical Engineering at the University of Oklahoma. She participated in research at MLEF last summer under Dr. Manivannan, synthesizing lithium-ion battery anodes using electroless deposition. She expects to graduate in the spring of 2016, and plans on attending medical school thereafter. Ultimately, she would like to be a part- or full-time medical missionary, as well as conduct research in the medical field.

PROJECT	SYNTHESIS AND CHARACTERIZATION OF PYROCHLORE CATALYSTS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Ms. George supported the development of pyrochlore-based catalysts for authothermal reforming of diesel fuel to syngas (H2 and CO). She synthesized various doped pyrochlore catalysts and characterized their acidic properties, basic properties, and structure, correlating the property changes achieved from different chemical compositions. Because of the stability of its coordinate structure, pyrochlore resists poisoning by coking and by the sulfur contained in diesel fuel. The strong integrity of the pyrochlore, as well as the ability to intersperse active metals throughout its structure, make it an excellent catalyst for reforming diesel fuel. This technology can be applied to more cleanly powering accessory systems such as auxilliary power units (APU's) in the transportation industry.

MENTOR

Dushyant Shekhawat received his B.S. and Ph.D. in Chemical Engineering from University of Minnesota-Twin Cities and Michigan State University, respectively. Since joining National Energy Technology Laboratory in 2001, he has worked on multiple projects focused on fossil energy applications such as fuel processing for fuel cell applications, catalytic upgrading of syngas as well as natural gas to value-added chemicals, gasification, desulfurization, and CO_2 conversion. He was among the key contributors to pyrochlore-based reforming catalyst which was recently licensed to a newly found Pyrochem Catalyst Company. He has published over 125 peer-reviewed journal publications, conference proceedings and reports, one book 'Fuel Cells: Technologies for Fuel Processing', 7 book chapters, and 12 patents.

LOUIS GUTIERREZ

4th Year PhD

Major: Computer Science

Rensselaer Polytechnic Institute

Mentor: David Tucker

BIOGRAPHY

Louis attended Rensselear Polytechnic Institute under the advisement of Dr. Krishnamoorthy. His primary research area involves modeling error propagation in Big Data. He is a returning MLEF, and is continuing his work under the advisement of Dave Tucker.

Louis will be completing his PhD at the end of the summer, and is actively looking for Post Doc positions in National Labs, or academic institutions that work closely with National Labs.

PROJECT	HYPER FACILITY
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Last year Louis worked alongside NETL researchers to develop a noise reduction model for the Hyper Facility. In continuation of this work, this year he is extending this model to include parameter optimization, as well as implementing a new noise reduction technique, which includes a Lazy Learning classification model.

MENTOR

Dr. David Tucker is the project leader and principle investigator for the Hybrid Performance (Hyper) project at the U.S. Department of Energy, National Energy Technology Laboratory (NETL). His prior research experience includes system integration and controls development for advanced power systems, fuel cell turbine hybrid power, solid oxide fuel cell cathode development, coal structure and catalytic liquefaction, f ash pyrolysis of lignite and biomass, and heterogeneous catalysis in gasification. Previous to his employment at NETL, Dr. Tucker had a diverse career in academia and industry, working as a university professor, a managing director of a public company, a lead engineer, a refractory specialist, a carpenter, and a ditch digger.

LEAH HALING

Recent graduate/Masters

Major: Mechanical Engineering

Arizona State University/ Tempe, AZ

B.S. in General Engineering, 2012
B.S. in Mathematics, 2012

James Madison University

Mentor: Justin Weber

BIOGRAPHY

Leah Haling recently graduated from Arizona State University in Tempe with a MS in Mechanical Engineering. She received a NSF funded Interdisciplinary Graduate Education and Research Traineeship (IGERT) Fellowship in 2012. Leah conducted research on target metrics for a solar thermal energy storage system in commercial/industrial building applications. She attained a BS in General Engineering and a BS in Mathematics from James Madison University in 2012.

Leah's career aspirations are to work for the Department of Energy in the area of Energy Policy. She also wants to be involved with deploying solar energy technologies to developing countries. Leah is recently engaged and is enjoying planning her wedding.

PROJECT	CHEMICAL LOOPING CIRCULATION RATE OPTIMIZATION AND DYNAMIC RESPONSE STUDY
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Ms. Haling worked on a cold flow chemical looping unit to determine the optimum circulation rate and to explore the dynamic response of the system. This unit has been constructed to match the geometry of a chemical looping reactor. She developed a Latin Hypercube test matrix and conducted all the experiments on the unit. The data was analyzed to determine the flow rates of various controls to obtain the optimum circulation rate. She will also update the LabView VI to allow for various input signals to be generated and sent to the flow controllers. She will then design and perform experiments to characterize the dynamic response. Finally, Leah will be using MFiX to model the system.

MENTOR

Justin Weber is General Engineer at Department of Energy's National Energy Technology Laboratory located in Morgantown, WV. He is a graduate of The Pennsylvania State University where he earned a Bachelor's degree in Mechanical Engineering. He performs research in the area of advanced fossil fuel energy systems including chemical looping combustion, electrical capacitance volume tomography, multiphase flow, computational fluid dynamics, and Python. Justin was introduced to the Department of Energy through a similar internship program back in 2007.

ALLANTE HARRISON

4th Year, Dual-Degree

Major: Mechanical Engineering

University of Arkansas, Fayetteville, AR

B.S. Mathematics, Spring 2014

Fort Valley State University

Mentor: Joseph Giove

BIOGRAPHY

Allante Harrison is a dual-degree scholar from Fort Valley State University. Having received his BS in Mathematics this past spring, Allante is currently a fourth year, dual-degree Mechanical Engineering student at the University of Arkansas in Fayetteville. He has participated in undergraduate research at his alma mater and at the Georgia Institute of Technology, conducting energy audits and studying hydraulic fracturing-attributed induced seismicity through the IRIS Internship Program, respectively. Allante will graduate in the spring of 2016 and pursue his Masters at Clemson University or the Georgia Institute of Technology.

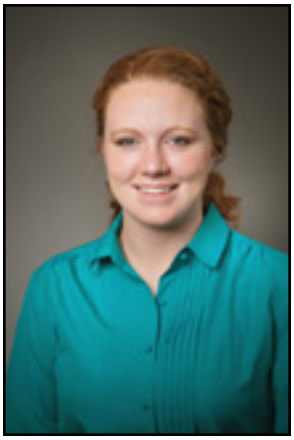
Mr. Harrison is a member of the National Society of Black Engineers, and Alpha Lambda Delta Honor Society.

PROJECT	PROJECT FINANCE MODELS
SITE	GERMANTOWN, MD

Allante spent the summer learning about project finance, and the associated models, terms, and thought processes integral to financing an engineering project. This required him to become familiar with Pro Forma financial statements, risk management techniques, and sensitivity analyses. Allante has also had the opportunity to assist Dr. Peter Rozelle with the development of a formation resistivity model to help explain anomalous Delta Log R plots in an area where multiple Marcellus wells in Northeast Pennsylvania have yielded poor results using well log and analysis tools.

MENTOR

Joseph Giove is the Director of the Division of Large Carbon Management Projects for the United States Department of Energy's Office of Fossil Energy. Mr. Giove's Division provides management oversight for the FutureGen 2.0, Clean Coal Power Initiative, and Industrial Carbon Capture & Storage Programs, and is also responsible for Budget Execution, Budget Formulation, and Procurements. Before joining the DOE, Mr. Giove worked in project and financial management for the Office of Management at the National Cancer Institute in Bethesda, Md. Mr. Giove holds a Bachelor of Science degree from Lee University, and a Master of Science in Computer Systems Management from the University of Maryland University College. Mr. Giove holds a PMP certification, is a Lean Six Sigma Blackbelt, and has 15 years of project management experience.



MACKENZIE HARRMANN

Junior

Major: Physics and Applied Mathematics

Virginia Military Institute, Lexington, VA

Mentor: Nicolas J. Huerta, Ph.D.

BIOGRAPHY

Mackenzie Harrmann attends the Virginia Military Institute in Lexington, VA where she is earning her BS in Physics and Applied Mathematics. She will be a junior this upcoming school year. Following her graduation in the spring of 2016, Mackenzie hopes to spend time in the US Army or continue on to graduate school in Computer Science, with an emphasis on Security.

Ms. Harrmann hopes to have a career in national defense one day. She wants to work with the military or other government agencies to help protect our nation and our soldiers. Mackenzie is very open to new paths and ideas for a career and is still exploring her options, however, she knows she wants to help keep her country safe and hopes to spend the rest of her life doing that.

PROJECT	FRACTURE ISOLATION AND FLUID TRANSPORT SIMULATIONS IN X-RAY COMPUTED TOMOGRAPHY DATA OF A FRACTURED CEMENT CORE
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, ALBANY, OR

Ms. Harrmann worked on image processing and fluid transport simulations in fractured cement samples. The goal of her work was to develop a program to isolate the fracture before and after injection of a reactive fluid. She worked on visualizing changes in the fracture due to dissolution/precipitation reactions. Fluid flow simulations were then used to compare to experimental data. This work is important to understanding the time-dependent leakage of CO_2-saturated brine up a wellbore.

MENTOR

Dr. Nicolas Huerta is a physical scientist in the Predictive Geosciences Division in the Office of Research and Development within the Department of Energy's National Energy Technology Laboratory. He holds a B.S. and M.S. in Geology from The University of California at Davis and a M.S.E. in Petroleum Engineering and Ph.D. in Geological Sciences from The University of Texas at Austin. He is a recent full-time federal employee, having completed his doctoral degree in December 2013 and was an intern in the Pathways program at NETL during his dissertation.

BENJAMIN HEINLE

Senior

Major: Earth Sciences

Minor: Astrophysics

University of Minnesota, Minneapolis

Mentor: Ernest N. Lindner

BIOGRAPHY

Ben Heinle attends The University of Minnesota in Minneapolis, where he is earning his B.S. in Earth Sciences. He is an undergraduate teaching assistant at the school for Earth Science courses and will be doing research on the isotactic response of Iceland under Dr. Kleinspehn this fall. Ben will graduate in the spring of 2015 and plans on attaining his Masters in Geological Sciences at the University of Minnesota-Duluth.

Mr. Heinle's career aspirations include conducting research and development for carbon sequestration and resources exploration. He eventually wants to work for industry and develop more efficient methods of extracting energy resources. Ben enjoys rock climbing and reading books. One of his biggest goals is to do research on the evolution of sedimentary basins in Antarctica and live in McMurdo Station.

PROJECT CHARACTERIZATION OF FRACTURE SURFACES

SITE NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

To address issues such as the impact of oil well development, an understanding of the fluid flow in the subsurface, especially in rock fractures, is needed. Characterizing fracture apertures (the opening of fractures) forms a basis of most subsurface flow models, and while readily used in equations, it is not readily measured or quantified in the laboratory.

To study this issue, my research seeks to quantify fracture volume and aperture in a rock core, and describe how both of these characteristics change with pressure. Also, I intend to use the results in a fluid flow model to test the accuracy of the resulting volume and aperture. The research will be conducted by extracting the digital description of a fracture volume from rock core. The image of the core was produced by an X-ray computed tomography machine which has the benefit of allowing the researcher to view the fracture without cutting it open. The core was then subjected to compression cycling at varying pressures while being imaged. The aperture of the fracture will be evaluated using various methods found in literature and, if time permits, implemented in a fluid flow model to examine flow characteristics and the impact of pressure.

MENTOR

Ernest Lindner is a senior researcher for URS working under the NETL Research and Engineering Services Support Contract located in Morgantown, West Virginia. He has a Ph.D. from the University of Minnesota at Minneapolis, and also has a Master of Science from the Massachusetts Institute of Technology in Cambridge, MA and a Bachelor of Engineering from the Cooper Union for the Advancement of Science and Art in New York, NY. Dr. Lindner's focus is on geomechanics, fracture flow and seismic risk analyses, and has worked on various government-related projects including the Yucca Mountain Nuclear Waste Repository, the Salt Nuclear Waste Program and the Second Repository Program for the Department of Energy. His experience includes working with URS and (URS-related firms such as Woodward-Clyde Consultants and Dame and Moore, Inc.) for over 15 years, and has worked in engineering and management for other organizations including Parsons Brinckerhoff and Battelle Memorial Institute. He is a licensed Professional Engineer in New Mexico and a member of the American Society of Civil Engineers and the International Society of Rock Mechanics.

VICTOR HUAYAMAVE

Ph.D. Candidate

Major: Mechanical Engineering

Thermal Sciences/Biomechanics

University of Central Florida, Orlando, FL

Mentor: Vito Cedro III & Sydni Credle

BIOGRAPHY

Victor completed a Bachelor's degree in Mechanical Engineering and a Master's degree in Mechanical Engineering with emphasis in Numerical Modeling of Thermo-Fluid systems from the University of Central Florida, where he currently pursues a Ph.D. in Mechanical Engineering with emphasis in Biomechanics and Thermo-Fluid systems. He has worked as an instructor for the Mechanical and Aerospace Engineering department teaching undergraduate courses oriented to engineering design using different computer aided design (CAD) software. As a researcher, Victor is currently working with the Arnold Palmer Hospital for Children to develop an optimized mechanism to help mitigate hip disorders in children. As a consultant, Victor has worked with many companies in Central Florida in the areas of Structural Engineering, Mechanical Design, Bioengineering, and Aerospace engineering. In particular, he has vast experience using CAD and Simulation software for developing solid models, specs, and 3D design concepts for mechanical products and machinery equipment. His experience allows him to take an engineering idea from a concept stage to a production stage.

PROJECT	AN ANALYSIS OF THE TECHNICAL AND ECONOMIC PERFORMANCE FACTORS OF ADVANCED HIGH TUNGSTEN ALLOYS BEING DEVELOPED FOR ADVANCED ULTRA SUPERCRITICAL COAL FIRED POWER PLANT TECHNOLOGY
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

The purpose of this is study is to look at materials studied by the DOE Advanced Supercritical (A-USC) program and promising new materials that have been developed but are not commercially available yet. This study will compare the basic cost and technical performance factors of high tungsten content iron and nickel base alloys that are being developed overseas for use in A-USC power plant applications with the low tungsten content iron and nickel base alloys that are being evaluated for use in the US DOE A-USC programs. A quantitative comparison of available cost and technical performance data might provide indications as to whether high tungsten content alloys might be more favorable in A-USC applications such as boilers, steam turbines, and high temperature/high pressure heat exchangers.

MENTOR

Vito Cedro III is a Project Manager in the Crosscutting Research Division of the Strategic Center for Coal at the National Energy Technology Laboratory (NETL) , Pittsburgh, Pa. He has a BS degree in Chemical Engineering from Carnegie Mellon U,, and a MS in Chemical Engineering from the U. of Dayton. He is a Registered Professional Engineer in the state of Pennsylvania, and a Project Management Professional as designated by the Project Management Institute. Prior to joining NETL in 2010, he worked in the primary aluminum industry in various technical, engineering and engineering management positions. He is also served for 3 years in the United States Air Force on active duty.

VIRGINIA JIMENEZ

First-Year Graduate Student

Major: Electrical Engineering

The University of Texas at El Paso, El Paso, Texas

B.S. in Electrical and Computer Engineering

The University of Texas at El Paso

Mentor: Thomas D. Brown

BIOGRAPHY

Virginia Jimenez attends the University of Texas at El Paso, where she is earning a MS in Electrical Engineering. As an undergraduate she participated as a research assistant in a project held by Dr. Ricardo von Borries, working on creating the software for an education oriented Ground Penetrating Radar (GPR) and designing and integrating a microwave scanner in which this GPR will be tested.

After earning her MS Virginia's career goals are to gain some professional experience by working for an industry under the area of systems and controls. Also, since last April Virginia passed an examination which certifies her as an Engineer in Training (EIT), she would like to continue with the next step in being certified as a Professional Engineer (PE) which is gaining professional experience under the guidance of a certified PE and going through the required examination process. Finally, it is one of Virginia's main goals after a time working for the industry sector to go back to college, earn a Ph.D. and go into academia to support and help younger minds into the field of engineering just like she was inspired by her college professors.

PROJECT	AUTOMATION OF HIGH TEMPERATURE AND PRESSURE SYSTEM
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

Virginia worked on automating a high temperature and pressure system. She was able to achieve this by developing the software that would control all the instrumentation included in this system by using Labview as her programming platform. As a result of Virginia's contribution in this project a sensor can be tested under similar temperature and pressure conditions to the ones found in oil drilling wells.

MENTOR

Thomas D. Brown, with 37+ years of federal service, is currently a Senior Research Engineer within NETL's Office of Research and Development, while also serving over his career as a Senior Program and Project Manager, and a Senior Policy Analyst for Department of Energy (DOE) at NETL, and Fossil Energy, Policy and Energy Information Agency HQ s' Offices. He has authored and co-authored over 80 publications, developed over 15 policy documents, has 7 Patents (some pending) in the areas associated with coal combustion and subsequent flue gas cleanup, coal gasification and subsequent syngas cleanup, sequestration of carbon dioxide in geologic formations, gas hydrate formation, and high temperature and gas sensor development.

EMMA JOHNSON

Undergraduate Junior

Major: Chemistry

Minor: Secondary Education

College of St. Benedict, St. Joseph, MN

Mentor: Ben Chorpening, Ph.D.

BIOGRAPHY

Emma Johnson attends the College of St. Benedict in Minnesota, where she is earning her degree in chemistry and secondary education. Aside from her studies, she participates in cross country running and track and field. She will graduate in the spring of 2016 and plans on getting her first teaching position in a Title 1 school.

Emma hopes to make a career in the field of science education, but she has not decided exactly where that will take her. She loves traveling and hopes to spend much time abroad. She always enjoys the outdoors and finding science around her. She hopes that she can make a difference in young people's lives and plant a love for science in them.

PROJECT	TESTING OF THE RAMAN GAS ANALYZER FOR NATURAL GAS AND SYNGAS APPLICATIONS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Emma worked to determine the accuracy, precision, and lower limit of detection of the NETL Raman Gas Analyzer. The Raman Gas Analyzer is a recently-developed spectroscopy system that uses a laser light to produce Raman scattering, which leads to the identification and quantification of gases in a mixture. The Raman Gas Analyzer has been developed to give a real-time, continuous read-out of relative mole percentages of many fuel gases. In the power industry, this system's measurements will permit adjustments in gas turbine engines to enable optimal, efficient combustion control based on the changes in fuel composition.

MENTOR

Ben Chorpening is a Research Mechanical Engineer in the Thermal Sciences Division of the Office of Research and Development at the National Energy Technology Laboratory, in Morgantown, West Virginia. He earned his PhD from the University of Illinois at Urbana-Champaign in Mechanical Engineering. He has performed research in combustion and sensors for fossil energy applications at NETL since 2002, and also serves as Task Technical Coordinator for Innovative Process Technologies Sensors & Controls.

COLTON KING

Senior Year Undergraduate

Major: Mechanical Engineering

Cedarville University, Cedarville Ohio

Mentor: Justin Weber

BIOGRAPHY

Colton King is entering his fourth year at Cedarville University in southwestern Ohio and will be graduating in May 2015 with a Bachelors of Science in Mechanical Engineering. For his senior capstone project, he and two other students will be designing and optimizing the shape of Cedarville University's Supermileage vehicle to achieve extremely low drag forces on the vehicle body. In addition to his studies in the engineering department, he will have been employed by the University's Production Service department for four years, having specialized in audio, lighting, and stage design and production. He is also one of the initial members of the Cedarville University Competitive Pistol Marksmanship Team and will be serving as the team's captain during the 2014-2015 season.

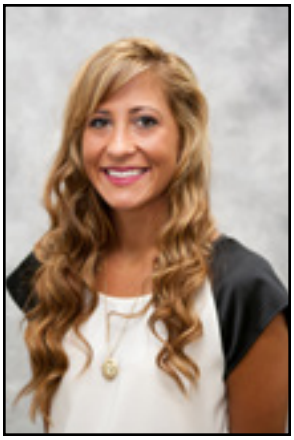
After graduating from Cedarville University, Colton hopes to become involved in the design and improvement of internal combustion engines, possibly working with the fluid dynamics of such engines. At some point he would like to further his education with graduate studies and perhaps after working in industry for a while, become a professor of engineering.

PROJECT	L-VALVE VELOCITY IMAGING AND CYCLONE FILTER MODELING
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Mr. King has worked on two projects during his time at the NETL Morgantown facility. The first was experimentally determining the velocity profile of multiphase flow exiting an L-valve in a cold flow chemical looping reactor unit. The method used fluorescing particles and image analysis to determine the velocity of groups of particles as they flowed through the exit pipe. The second project was simulating conditions in the cyclone filter of the same cold flow unit using ANSYS' Fluent software. The goal of the project was to simulate combustion occurring below the cyclone outlet which caused solid particulate to be ejected through the top of the cyclone rather than continuing through the loop process.

MENTOR

Justin Weber is General Engineer at Department of Energy's National Energy Technology Laboratory located in Morgantown, WV. He is a graduate of The Pennsylvania State University where he earned a Bachelor's degree in Mechanical Engineering. He performs research in the area of advanced fossil fuel energy systems including chemical looping combustion, electrical capacitance volume tomography, multiphase flow, computational fluid dynamics, and Python. Justin was introduced to the Department of Energy through a similar internship program back in 2007.



ASHLEY LEDONNE

4th-Year Undergraduate

Major: Chemistry

Minor: Business

Carlow University, Pittsburgh, PA

Mentor: Evan Granite & Elliot Roth

BIOGRAPHY

Ashley LeDonne attends Carlow University in Pittsburgh, where she is earning her BS in Chemistry and a minor in Business. Ashley will graduate in the spring of 2015, and plans on attaining her Master of Science in Environmental Science and Management and Masters of Business Administration with a Sustainability focus (MBA-S) from Duquesne University.

Ashley's career aspirations are to be an asset to an environmental consulting organization that is committed to supporting sustainable development through responsible environmental stewardship. She is especially interested in energy related projects. Ashley enjoys being outdoors, and would like to be a part of her organizations' field studies. Her ultimate goal is to help stop global climate change, and to expand the scientific community with research that will support sustainable energy alternatives.

PROJECT	INVESTIGATING PEROVSKITE MATERIALS FOR OXYGEN STORAGE
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

Ms. LeDonne worked on the separation of oxygen from air using a novel perovskite material as sorbent. The research employs packed bed reactor in a clam-shell furnace, to analyze the absorption and desorption of oxygen. The composition of the pervoskite material and the temperature of the furnace were varied to identify the best potential sorbents to store and release oxygen. Pure oxygen is desired in a wide variety of industrial, medical, and laboratory applications. Perovskite materials are of interest due to their significant oxygen storage and release capabilities with good stability. Perovskite sorbents provide an interesting alternative to the cryogenic separation used today.

MENTOR

Evan J. Granite is a Research Group Leader at the Department of Energy's National Energy Technology Laboratory (NETL), USA; Technical Coordinator for NETL's in-house research on Rare Earth Detection and Recovery; and an Adjunct Research Professor of Chemical and Petroleum Engineering at the University of Pittsburgh, USA (volunteer position). He completed postdoctoral research at the Department of Energy, received a PhD in Chemical Engineering from the University of Rochester, and BS and MS degrees in Chemical Engineering from The Cooper Union. His research has focused on mercury, trace contaminant, and carbon dioxide removal from flue and fuel gases. He is the principal or co-investigator for projects on the capture of mercury, arsenic, selenium, phosphorus, cadmium, and antimony from coal-derived flue and fuel gases, and carbon dioxide separation from flue gas. He has coauthored thirty eight peer-reviewed journal articles, eight patents/patents pending, two hundred and five conference papers and presentations, and forty nine DOE reports of invention. His research interests are in separation technologies; pollution clean-up; catalysis and surface chemistry; photochemistry; electrochemistry; energy/utility systems; capture, storage, and utilization of carbon dioxide; and detection and recovery of rare earth elements from coal-derived streams.

CHARLOTTE METZGER

1st-Year Graduate Student

Major: Environmental and Occupational Health Sciences

LSUHSC School of Public Health, New Orleans, LA

Bachelor of Science, 2013

Louisiana State University

Mentor: James De Paoli

BIOGRAPHY

Charlotte Metzger attends the LSUHSC School of Public Health in New Orleans, LA where she is earning her Master in Public Health in Environmental and Occupational Health Sciences. She has an undergraduate degree in biology and sociology from Louisiana State University. Charlotte currently works as a clinical coordinator at the Louisiana Cancer Research Center with Dr. Michael Hagensee on a study looking at the interaction of the Epstein-Barr virus (EBV) and human papillomavirus (HPV) in the development of cervical dysplasia. After graduating next spring, she plans to pursue a career in public health in toxicology or industrial hygiene, and would like to eventually work for the Centers for Disease Control and Prevention (CDC) or the World Health Organization (WHO). In her free time she enjoys playing tennis, practicing yoga, baking, and traveling. The Mickey Leland Energy Fellowship has provided an opportunity to gain valuable experience in the public health field.

PROJECT	INDUSTRIAL HYGIENE AND ERGONOMICS
SITE	STRATEGIC PETROLEUM RESERVE, NEW ORLEANS, LA

The storage sites at the Strategic Petroleum Reserve (SPR) are periodically sampled for hazardous chemical and physical exposures, which have the potential to impair employee health and can negatively impact their long-term quality of life, along with impeding the physical ability to perform work tasks. Current potentially hazardous exposures include volatile organic compounds, hydrogen sulfide, metal fumes, and noise. Improper ergonomic practices can also negatively affect the physical health of workers, causing both acute and chronic trauma. Under the direction of James De Paoli, the lead Certified Industrial Hygienist at the SPR in New Orleans, monitoring of common potential exposures and ergonomic assessments will be performed.

MENTOR

James De Paoli holds the position of Industrial Hygiene and Behavioral Safety Lead for Fluor Federal Petroleum Operations LLC, a prime contractor for the Department of Energy's Strategic Petroleum Reserve, and is located in New Orleans, LA. James has served as a mentor with the Mickey Leland Energy Fellowship Program for 8 years.

ABHILASH NAIR

2016

Major: Computer Science

Georgia Institute of Technology, Atlanta, GA

Mentor: J. Peter Hensel

BIOGRAPHY

Abhilash Nair attends Georgia Institute of Technology in Atlanta, where he is earning her BS in Computer Science. He participated in many volunteer organizations such as Habitat for Humanity, Environmental Club, and the Kennestone Hospital Volunteen Program. Abhilash will graduate in the spring of 2016 and plans to work either as a software developer or a database administrator prior to earning his masters from Georgia institute of Technology.

Mr. Nair's career aspirations include working for a tech company in Silicon Valley. He is also interested in creating his own startup. Abhilash enjoys traveling and would like to visit Japan and Italy. His biggest goal is to constantly update and improve his programming skills and possibly create a successful startup in the later future. He also has a goal to promote computer science among his fellow peers and to create programs that can benefit many people all across the world.

PROJECT	TIME SAVING TRACKING SYSTEM
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Mr. Nair worked on developing a time saving tracking system that takes its inputs from emails, user notes and other documents and organize them into historical log files for each activity/project. The program will allow a user to log in and store his emails, notes, and other documents either by locating the file or by manually entering in the fields required and he will be able to store input onto a MySQL database and retrieve it in another panel in order to view it.

MENTOR

Mr. J. Peter Hensel is the R&D Safety Analysis and Review System Quality Assurance Engineer for the Morgantown, WV campus of the National Energy Technology Laboratory. He holds a Bachelor of Science degree in Electrical Engineering from Lafayette College, a Bachelor of Arts degree in Liberal Arts from Wheaton College, and has 24 graduate school credit hours in Computer Science from West Virginia University. Prior to his working in lab safety he was involved in the development of novel fossil energy instrumentation and controls, artificial intelligence, and data acquisition systems. He has been at NETL for his entire 31-year career.

DECIE ODOM

Senior

Major: Information Technology

Minor: Web Architecture and Design

Georgia Southern University, Statesboro, GA

Associate's Degree in Computer Science, 2012

Lurleen B. Wallace College

Mentor: Scott Van Nederynen & Lisa Rose

BIOGRAPHY

Decie Odom is a fourth year Information Technology student at Georgia Southern University in Statesboro, Georgia. She holds an Associate's Degree in Computer Science and is currently pursuing a Bachelor of Science in Information Technology with a second discipline in Web Architecture and Design.

She has been a board member of Rebecca's Café, a non-profit group that provides meals for underprivileged people in the Statesboro community, for two years and volunteers at the local food bank. She is a social justice advocate and uses her Information Technology skills to promote social justice causes. She aspires to use her degree to give back to the community through work with non-profit organizations. Decie seeks to work for the Jimmy Carter foundation or similar institution upon graduation.

PROJECT	ELECTRONIC INFORMATION SYSTEM SCHEDULING
SITE	STRATEGIC PETROLEUM RESERVE, NEW ORLEANS, LA

Decie is working with mentors Scott Van Nederynen and Lisa Rose at the Strategic Petroleum Reserve (SPR) in New Orleans, Louisiana. Decie's project is to produce an Assessment Tracking System (ATS) Electronic Information System Record Appraisal Report. She will evaluate the ATS system against Code of Federal Regulations guidelines to ensure the record's management system is compliant. She will be using the Records Inventory and Disposition Schedule to evaluate the ATS system and ensure that records are being scheduled in compliance with the National Archives and Records Administration (NARA) approved guidelines. The project will highlight areas of opportunities in the current system and recommend a plan for making the necessary system updates. At the close of the program, Decie will also present work instructions and documents needed for future use as a guide for evaluating system scheduling.

MENTOR

D. Scott Van Nederynen holds the position of Records Management Enterprise Architect Supervisor for Fluor Federal Petroleum Operations LLC, a prime contractor for the Department of Energy's Strategic Petroleum Reserve, and is located in New Orleans, LA. Scott Van Nederynen has been at the Department of Energy's Strategic Petroleum Reserve in New Orleans, LA since July 1995. From 1990 to 1995, he was employed at the Savannah River Site, in the Configuration Management and Safety Services Division. He received a Master of Science in Systems Analysis from the Georgia Institute of Technology, Atlanta, GA in 1990. Having studied interdisciplinary Engineering and Management he received a Bachelor of Science from Clarkson University in Potsdam NY in 1983.

NELSON OLOFINDAYO

4th-Year Senior

Major: Mechatronics (Robotics) Engineering B.S.

Minor: Aerospace Engineering

Southern Polytechnic State University, Marietta, GA

Avionics Bench Technician, 2013

Atlanta Technical College

Mentor: Dr. Vyacheslav Romanov

BIOGRAPHY

Nelson Olofindayo attends Southern Polytechnic State University in Marietta, GA, where he is earning his BS in Mechatronics Engineering. As of December 2013 he has completed coursework in Avionics at Atlanta Technical College. Nelson will graduate in the spring of 2016 and plans on attaining a graduate degree in Robotics at the University of California-Berkley, Carnegie Mellon University or Georgia Tech University.

Mr. Olofindayo's career aspirations include designing a robotic exoskeleton for amputees and military purposes, also researching humanoid development. He eventually wants to found a company devoted to improving the overall human quality of life through the use of technology. Nelson has a variety of hobbies including photography, musical analysis, auto maintenance, and sports. His biggest goal is to help those who cannot help themselves. He hopes to embody Dr. King's timeless words "I look to a day when people will not be judged by the color of their skin, but by the content of their character."

PROJECT	VOLUMETRIC EFFECTS IN COAL SORPTION CAPACITY MEASUREMENTS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

Mr. Olofindayo worked on debugging a gas analysis program to improve the reliability of data acquisition for CO_2 adsorption through an isotherm gravimetric apparatus. The program is designed to optimize the data providing for low standard errors and high efficiency. The debugged program will collect data which will then be used to compare data acquired from the manometric system.

MENTOR

Dr. Vyacheslav Romanov is the Simulations, Data Analysis & Visualization Team Lead in Computational Sciences & Engineering Division at the Department of Energy's National Energy Technology Laboratory, and is located in Pittsburgh, PA. Romanov holds Ph.D. in Physics and Mathematics from Moscow Tech, Ph.D. in Chemistry from University of Pittsburgh, and MBA from Waynesburg College (University). He is an author of four inventions and over 40 publications. Prior to joining the Department of Energy, Dr. Romanov worked on Energy and Ecology research projects in support of the Russian space program as well as on development of glass-ceramic coatings with applications for automotive business, laser marking, and electronics at Ferro Corporation in Washington, Pennsylvania.

ALEX PRITCHETT

2nd-Year Graduate

Major: Computational/Applied Mathematics

Georgia State University, Atlanta, GA

B.S. Mathematics, 2012

University of Georgia, Athens, GA

Mentor: Jan Steckel

BIOGRAPHY

Alex Pritchett attends Georgia State University where he is pursuing his MS in Computational/Applied Mathematics. His research interests are numerical linear algebra and mathematical optimization. He is especially interested in formulation, implementation, and analysis of numerical linear algebraic methods.

Alex would like to finish his PhD and work in the design of numerical software packages for implementation of optimization and numerical linear algebraic techniques. He hopes to develop more robust and efficient methods to solve real-world computational problems.

PROJECT FORCE FIELDS FOR IONIC LIQUIDS

SITE NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

Alex worked on the development and evaluation of force fields for ionic liquids. The project sought to develop accurate force fields for simulation of the properties of gases in ionic liquids. Alex investigated the accuracy of simulation data and analyzed the numerical properties of the methods involved. The fastest simulations are afforded by point-charge based force fields. More accuracy is provided by (point-dipole model) polarizable force fields, but this accuracy comes at a computational cost for the evaluation of the electrostatic energy. Analysis of force field accuracy and implementation of robust numerical methods allows for more accurate predictions from simulations.

MENTOR

Jan Steckel earned her PhD in Theoretical Chemistry at the University of Pittsburgh and carried out post-doctoral research at the University of Vienna. She was awarded a National Research Council Fellowship at the National Energy Technology Lab. Her honors include the Lubrizol Fellowship, University of Pittsburgh; Safford Award for Excellence as a Graduate Student Teacher, University of Pittsburgh; National Science Foundation Travel Grant; the Bayer Fellowship, University of Pittsburgh; Outstanding Graduate, Department of Chemistry, West Virginia University; the Moore Scholarship, West Virginia University; the Eberly Arts and Sciences Scholarship, West Virginia University; University Fellowship, The Ohio State University; and Phi Beta Kappa.

SOHEIL RAZMYAR

2014

Mechanical Engineering (Ph.D. Candidate)

Materials Engineering

University of North Carolina, Charlotte

Master of Science in Mechanical Engineering, 2011

West Virginia University

Mentor: Dr. Charles H. Henager Jr.

BIOGRAPHY

Soheil Razmyar attends University of North Carolina at Charlotte, where he is earning his PhD in Mechanical Engineering. He has been actively involved in performing different renewable energy projects such as Energy-Related Materials (Solid Oxide Fuel Cells (SOFC's)) and Renewable Ocean Energy Research (Tidal in Stream Energy Conversion (TISEC)). His PhD dissertation is focused on synthesis of two-dimensional material ((MoS2)-based field-effect transistors)) that goes beyond graphene for the next generation of nanoelectronics under Dr. Haito Zhang at UNC Charlotte. Soheil will graduate in the summer of 2015 and plans to pursue his postdoc in of the DOE facilities working on sustainable and renewable energy sources projects. Mr. Razmyar career aspiration includes working for TE Connectivity or Boeing which he can contribute to variety Energy-Materials projects.

PROJECT	SILICON CARBIDE BASED ALLOYS
SITE	PACIFIC NORTHWEST NATIONAL LABORATORY, RICHLAND, WA

Soheil Razmyar worked to develop a new high-temperature structural material based on Polymer-derived silicon carbide (SiC) ceramics, which show enhanced mechanical properties (fracture toughness and strength) and high thermal conductivity. The project was aimed to achieve a dense SiC-based material system using pressureless sintering methods. Effects of adding different amounts of sintering aids such as Si and SiC-nano particles on sintering and grain growth was studied. Further improvement of thermal conductivity was studied by incorporating carbon nanotubes (CNTs) to the system.

MENTOR

Since joining PNNL in 1976, Dr. Henager has worked in a variety of materials science areas, concentrating on radiation effects, mechanical properties and strength of materials, and computational materials science of crystal growth and of interfaces and deformation in metals and alloys. He currently leads a team of researchers in the Nuclear Sciences Division at PNNL where a majority of work is for the US DOE, Fusion Energy Sciences and Nuclear Energy. He completed a year assignment to the US DOE, Basic Energy Sciences, where he helped plan a major new initiative in Computational Materials Science in 1998. He has published over 115 papers and articles, has edited two books, and has eight U.S. Patents. He is also Adjunct Professor, Dept. of Materials Sciences, University of Washington, Seattle, WA.

LETICIA ROJAS

2014

Major: Neurobiology

Harvard University, Cambridge, MA

Other Degree(s), Year

College/University

Mentor: Natenna Dobson

BIOGRAPHY

Leticia Rojas is a recent graduate of Harvard University in in Cambridge, Massachusetts where she majored in neurobiology. Leticia became interested in energy and environmental policy her junior year after taking a course on climate and energy. Leticia plans on earning a Master's in an energy related field in the future.

Leticia is passionate about energy and the environment, and her career goal is to work on promoting a low carbon energy future and developing renewable energy projects within the public or private sector.

PROJECT	OIL AND GAS DEVELOPMENT IN SOUTH AFRICA
SITE	U.S. DEPARTMENT OF ENERGY HEADQUARTERS, WASHINGTON, DC

Ms. Rojas worked in the Office of Oil and Gas under Natenna Dobson, a member of the international team. Her project focused on evaluating opportunities and challenges of safe and responsible oil and gas development in South Africa. She examined the potential of both current reserves and future resources, as well as the technical and environmental challenges that developing these resources could pose. Leticia was able to propose possible solutions to these challenges by looking at NETL's extensive research in offshore and unconventional oil and gas and identifying research areas that could be applied to take on South Africa's unique technical and environmental challenges in oil and gas.

MENTOR

Natenna Dobson is a Physical Scientist and Industry Analyst for the U.S. Department of Energy's (DOE) Office of Oil and Natural Gas within the Fossil Energy program. Her work focuses on enabling responsible development of domestic oil and natural gas resources through innovative research, policy analysis, and international leadership. As an international industry analyst, she has experience performing regulatory, legislative and market analysis on oil and gas production and environmental management issues in the regions of Africa and the Middle East. She has served many roles for her office including working as a physical scientist on technical issues related to unconventional oil and gas development, energy-water nexus, and hydraulic fracturing.

A graduate of University of North Carolina at Chapel Hill and Johns Hopkins University, Natenna obtained Bachelor and Masters of Science degrees in Environmental Sciences and Public Policy prior to joining DOE. She also serves on DOE's Emergency Restoration team responding to national disasters.

CAMILLA SCHRAMEK

Junior

Major: Environmental Science and Dual Math and Political Science

Emory University, Atlanta, GA

Mentor: Cathy Summers

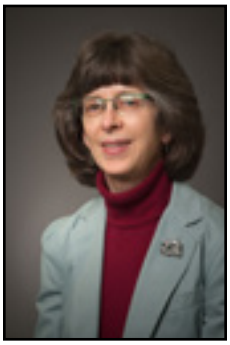
BIOGRAPHY

Camilla Schramek attends Emory University in Atlanta, where she is earning her BS in Environmental Science and BA in Mathematics and Political Science. She participates in undergraduate research at Emory; under Dr. Eri Saikawa she is using the Model for Ozone And Related chemical Tracers (MOZART) at a global scale to analyze exposure due to vehicle emissions in 2010. She will use this model to analyze how the transport emissions affect regional and global air quality and human health.

Ms. Schramek's career aspirations include working on climate change and energy policy at an international level. Her biggest goal is to regulate the consumption and creation of fossil fuels. She hopes that in the future the United States and other developed countries depend on renewables to provide their primary source of energy. Camilla wants to better the lives of those negatively affected by environmental issues in developing countries.

PROJECT	RESEARCH ON ORD COMMUNICATIONS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, ALBANY, OR

Camilla developed a scorecard for NETL's Office of Research and Development (ORD) communications, which evaluates and presents the trend of items from the Communications Implementation Matrix. The Communications Matrix focuses on specific communications activities in four categories: Research Outcomes, Research Opportunities, Educational Outreach, and ORD Communications. Ms. Schramek analyzed data from these different communication items to establish baselines, determine past trends, and find ways to measure the success of each item. She also created a plan for new ways that the success of certain communication items can be measured in the future.



MENTOR

Cathy Summers is a member of the Education, Collaboration, and Outreach team in NETL's Office of Research and Development (ORD). She is educated as a geologist, with a Bachelor's degree from Wichita State University (Wichita, KS) and a Master's degree from Oregon State University (Corvallis, OR). She leads efforts on the ECO team to improve communications within ORD.

ANNIE SHEPPARD

Rising Senior

Major: Science, Technology, and International Affairs

Minor: Latin American Studies

Georgetown University, Washington, DC

Mentor: Rick Elliott

BIOGRAPHY

Hailing from the state of Indiana, Annie Sheppard is a rising senior in the Edmund A. Walsh School of Foreign Service (SFS) at Georgetown University. Within the SFS, her major is Science, Technology, and International Affairs (STIA). Annie speaks Spanish and Portuguese fluently and studied abroad in Rio de Janeiro, Brazil during the fall of her junior year.

Annie is exploring career opportunities in both the public and private sector. She is also applying for a Fulbright Scholarship to conduct research on the Latin American energy market. Outside of school, Annie frequents yoga in the Georgetown area and works as a barista and manager at Uncommon Grounds, a student run coffee shop on campus.

PROJECT	METHANE EMISSIONS FROM MIDSTREAM NATURAL GAS INFRASTRUCTURE
SITE	U.S. DEPARTMENT OF ENERGY HEADQUARTERS, WASHINGTON, DC

At the DC headquarters office, Annie worked in the Office of Oil and Gas under the mentorship of Rick Elliott. Annie worked on reducing methane emissions from midstream natural gas facilities, including gathering and transmission pipelines, compressor stations, storage facilities, and local distribution piping networks. Essentially, "midstream" includes everything that is not the production well and the final use of the natural gas. Annie consolidated and analyzed data in order to assist the Office of Oil and Gas in advancing the administration's commitment to reduce methane emissions.

MENTOR

Rick Elliott is the Director of the Division of Advanced Supply and Facilities in the Office of Oil and Gas. He is a registered professional engineer with 40 years of broad-based experience facilities planning, design, construction, and operations, including the natural gas sector. Emissions of methane gas from the nation's natural gas "midstream" facilities - which include transmission pipelines , compressors, processing plants and local distribution systems – have attracted increasing scrutiny in recent years due to the significant increase in domestic natural gas production and use. Methane is a potent greenhouse gas that is the principal constituent of natural gas. In support of the Administration's Climate Action Plan, the Office of Fossil Energy hopes to fill an important role by sponsoring research and development directed toward detection and control technologies that will more quickly identify methane leaks and promote more efficient natural gas midstream system operations.

ANDREW SISLER

Senior

Major: Mechanical Engineering

University of Maryland, College Park, MD

Mentor: Douglas Straub

BIOGRAPHY

Andrew Sisler attends Frostburg State University, where he is earning his B.S. in Mechanical Engineering from the University of Maryland. He loves hanging out with friends and family and volunteering at his church. He lives at home where he works on his family's farm and enjoys being outdoors. He is unsure of his exact plans after graduation, but he knows he wants to discover a passion that he can invest the rest of his life into.

Andrew has a strong desire to work for an aerospace company in the future, designing or testing aircrafts. He has an interest in flying, and wants to integrate that into his engineering experience. But he also loves working with and being around people, and wants to make that a large part of his future.

PROJECT	1.) FINITE ELEMENT ANALYSIS OF FILM COOLING EFFECTIVENESS FOR SIMULATED GAS TURBINE COMPONENTS 2.) DESIGN AND MODELING OF NOVEL PARTICLE SEPARATION DEVICES FOR CHEMICAL LOOPING COMBUSTION SYSTEMS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Andrew worked on two projects while at NETL. The first was determining ways to improve efficiency of the filtration system on the chemical looping reactor. This was achieved by designing and modelling new and updated components to test their performance. His second project was investigating the heat flux through a sample coupon to test the effectiveness of film cooling for the application of turbine fins. This was also done using modelling and experimental data collected in the lab with the aerothermal rig and comparing the results to thermal imaging performed on the coupons.

MENTOR

Doug Straub is a Mechanical Engineer at the National Energy Technology Laboratory. Doug received his MSME Degree from the Ohio State University, and started working at NETL at about the same time Andrew was born. He has been blessed with opportunities to work on some really great projects with some really great people. Currently, he is investigating ideas to improve the efficiency of gas turbine engines through enhanced cooling concepts. He is also leading an effort to develop alternative approaches to burn fossil-fuels with significantly lower greenhouse gas emissions. Doug looks forward to participating in the MLEF Program each year.

MATTHEW STADELMAN

Junior

Major: Applied Physics

Minor: Mathematics

West Virginia Wesleyan College, Buckhannon, WV

Mentor: Dr. Neal Sams

BIOGRAPHY

I am attending WV Wesleyan College where I am earning a degree in Applied Physics with a minor in mathematics. I have held internship positions at WVWC for the previous two summers. My previous position was working as a research assistant under Dr. Tracey Delaney analyzing and processing astronomical data from the EVLA. After graduation from Wesleyan I intend to continue onto West Virginia University to earn a BS in Engineering.

Ultimately I would like to have a career somewhere in the energy field, preferably being able to stay in West Virginia, my home state.

PROJECT	MODELING NATURALLY FRACTURED GAS RESERVOIRS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

I am working to expand the functionality of the current 1-D modeling of natural gas reservoirs fully into 2-D and then 3-D. The end goal of the project is to determine a correction factor for the one-dimensional model based on the properties of the reservoir and well bore. This would allow us to take advantage of a fast 1-D model while retaining some of the accuracy gained in much slower 2-D and 3-D models. Another side goal is to modify the modeling program in 2-D and 3-D to allow the use of different geometries in the mesh and observe how that affects the accuracy of the results.

MENTOR

Dr. W. Neal Sams is a fellow R&D scientist with URS at the National Energy Technology Laboratory in Morgantown, WV. He has a PhD in physics from the University of Houston. Dr. Sams research interests are petroleum reservoir engineering and simulation. Dr. Sams is the author of NFFLOW a discrete fracture reservoir simulator meant to simulate production and storage in naturally fractured tight sand and shale reservoirs. Prior to work at NETL Dr. Sams was a senior reservoir engineer with H. J. Gruy and Associates in Houston, Texas.

SIOBHAN L. TARVER

Postdoc

Major: Environmental Health Sciences

Tulane University, New Orleans, LA

M.S. Innovation and Technology Entrepreneurship, 2006

California State University, San Bernardino

B.S. Chemistry and Mathematics, 2005

Texas Southern University

Mentor: Michael Huff

BIOGRAPHY

Siobhan Tarver is a postdoctoral researcher in Environmental Health Sciences at the Tulane University School of Public Health and Tropical Medicine. She earned her Doctoral degree in Environmental Toxicology specializing in air pollution and bio-analytical applications while matriculating through the NASA Harriet Jenkins Doctoral Fellowship Project at Johnson Space Center in Houston, and completed training in Risk Analysis and Communication at the Harvard University School of Public Health in Boston. In 2004, Siobhan participated in the Mickey Leland Energy Fellowship program as an undergraduate student working with the SPR Environmental group on refining the methodology for identifying environmental aspects and impacts which is still utilized today. Siobhan's career aspirations include working for a government agency and serving as a faculty member at a minority serving institution. Her ultimate goal is to educate others on the importance of contributing to studies necessary for the protection of the environment and human health.

PROJECT IMPROVING VEHICLE FLEET EFFICIENCY

SITE STRATEGIC PETROLEUM RESERVE, NEW ORLEANS, LA

Siobhan is working with Mike Huff, researching potential solutions to support the sustainability goals for Executive Orders 13423 and 13514 which both promote energy and water conservation at federal sites. This project aims to identify methods to reduce Scope 1 greenhouse gas generation and fleet petroleum consumption through efficiency and alternative fuels per the Federal Fleet Performance Presidential Memorandum. Siobhan will examine the usages of security and non-security vehicles and identify factors that may affect sustainability over time. She will also evaluate the fiscal feasibility of reducing or eliminating vehicle idling and make recommendations for optimizing vehicle use to meet fleet management goals.

MENTOR

Michael Huff holds the position of Environmental Sustainability Specialist for Fluor Federal Petroleum Operations LLC, a prime contractor for the Department of Energy's Strategic Petroleum Reserve (SPR), and is located in New Orleans, LA. He received his Bachelor of Science degree in Zoology from Mississippi State University in 1974 and his Master's degree in Wildlife and Fisheries at Texas A&M University in 1979. He has worked in the environmental arena at the SPR since 1979 at Bryan Mound, Sulphur Mines, West Hackberry, St. James Terminal, and for the last 24 years at the New Orleans headquarters. He served as Ms. Tarver's mentor with the Mickey Leland Energy Fellowship in 2004 and again in 2014.

JAMIE TRINDELL

1st-Year Ph.D. Student

Major: Ph.D. Organic Chemistry, Current

University of Texas at Austin

B.S. Chemistry/Biochemistry, 2014

University of West Florida, Pensacola, FL

Mentor: Dr. Douglas Kauffman

BIOGRAPHY

Jamie Trindell recently graduated from the University of West Florida in May 2014 with her B.S. in Chemistry with a Biochemistry specialization. She conducted undergraduate research synthesizing and characterizing novel fluorescent organic compounds under the guidance of Dr. Michael Huggins and Dr. Pamela Vaughan. Jamie will be attending the University of Texas at Austin this fall to begin her Ph.D. studies in inorganic chemistry. She plans on studying lanthanides and inorganic polymers under the guidance of Dr. Bradley Holliday

Jamie plans on pursuing a research career in industry focusing on environmental sustainability. In her spare time she enjoys riding her horse, fishing, swimming, and hiking.

PROJECT | SYNTHESIS AND CHARACTERIZATION OF METAL NANOCLUSTERS

SITE | NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

This summer Jamie conducted research under the guidance of Dr. Douglas Kauffman. Her work involved the synthesis and characterization of gold nanoclusters capped with organic thiol ligands. These types of nanoparticles have proven very effective as catalysts in various reactions, including the reduction of carbon dioxide to carbon monoxide. The small size of these metal clusters induces unique chemical properties very different from those exhibited by the bulk metals, including fluorescence emission in the near-infrared. Attempts were also made to dope these gold nanoclusters with iron, cobalt, and nickel and to characterize any physical and chemical changes produced upon doping.

MENTOR

Douglas Kauffman is a research chemist in the Molecular Science Division at NETL Pittsburgh. Douglas obtained his Ph.D. in chemistry from the University of Pittsburgh in 2010. After completing a National Academies of Science post-doctoral research fellowship he joined the NETL as a staff scientist.

Doug's research interests center on the synthesis, characterization and evaluation of new nanocatalyst materials for clean energy applications, such as converting carbon dioxide (CO_2) into other valuable chemicals or usable fuel sources. A central theme to this research is developing relationships between the physical and electronic structure of materials and their catalytic activity. Structure-property relationships are developed by coupling catalyst performance with fundamental optical, electrochemical and computational studies. Ultimately these efforts will allow rational design of nanocatalysts with extremely high performance and product selectivity for a variety of applications.

DOMINIQUE WILLIAMS

Ph.D., 2014

Major: Chemistry

Georgia State University, Atlanta, GA

B.Sc., 2009

Virginia Commonwealth University

Mentor: Lawrence Shadle & Ayyakkannu Manivannan

BIOGRAPHY

Dominique Williams attended Georgia State University where she earned her Ph.D. in Chemistry. Her research, working under Dr. Kathryn B. Grant, entailed the design of biomimetic models of acidic phospholipases from metal ions and complexes. These metal-based agents have potential applications as lysosomal (or cytoplasmic) phospholipase mimics to study signal transduction pathways, probes to study lipid model systems, or as potential therapeutic agents to reverse the build-up of phospholipids in acquired or genetic lysosomal storage diseases. Another major project was her work with Cu(II) complexes as DNA photocleavage agents for future applications in photodynamic therapy.

Dominique's career aspiration is to become an academic professor in which she plans to focus on undergraduate research and teaching. She has a strong desire to see others succeed and promote the achievements of underrepresented minorities in the STEMs. She is also passionate in sharing her love for science to the community and grade-level students, and enjoys performing scientific demonstrations at local schools and science fairs.

PROJECT	SYNTHESIS OF SOLID STATE LITHIUM ELECTROLYTE
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, MORGANTOWN, WV

Dominique worked on the synthesis and characterization of solid state lithium electrolytes. The major goal of her project is to find a high conducting, stable Li-ion solid electrolyte that could perhaps replace the flammable, volatile, and unstable organic liquid-based electrolytes currently used in today's batteries.

MENTOR

Dr. Lawrence Shadle has been with the Department of Energy since 1983 upon graduation for the University of Pennsylvania in Fuel Science. He has worked for that entire time at the National Energy Technology Laboratory in the in-house research organization known as the Office of Research and Development. For ten years Dr. Shadle led in-house research investigating oil shale retorting. More recently, he helped to develop the basis and strategic role of U.S. oil shale in the 2005 Energy Policy Act. He has led a research team responsible for conducting validation tests on fluidization for computational fluid dynamic models in support of integrated gasification combined cycle, combustion systems, and advanced power research programs.

JULIA WITTKAMPER

3rd-Year Ph.D. Candidate

Major: Materials Science and Engineering

Carnegie Mellon University, Pittsburgh Pa

M.S. In Materials Science and Engineering, 2014

Carnegie Mellon University

B.S. In Chemistry, 2012

University of Maryland, Baltimore County (UMBC)

Mentor: Dr. Paul Ohodnicki

BIOGRAPHY

Julia Wittkamper attends Carnegie Mellon University in Pittsburgh, where she is earning her Ph.D. in Materials Science and Engineering. She received her Masters from CMU this year and earned her Bachelor's degree in Chemistry from UMBC in 2012. Her current doctoral advisor is Dr. Salvador and her research is on the use of Pulsed Laser Deposition in the isolation of metastable polymorphs of metal oxides. Ms. Wittkamper's career aspirations include working in industry or for the government.

PROJECT THIN FILM MATERIALS FOR HIGH TEMPERATURE SENSING APPLICATIONS

SITE NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

Optical sensors have advantages over the more common conductometric sensors, including a large number of measurable properties and resistance to electromagnetic interference. Ms. Wittkamper used Pulsed Laser Deposition (PLD), which allows for precise stoichiometric control, to create undoped and La-doped strontium titanate thin films on quartz substrates. These films have possible applications in optical gas sensing in harsh environments with high temperatures and reducing atmospheres, such as those found in solid oxide fuel cells.

MENTOR

Paul Ohodnicki is a material scientist in the chemistry and surface science division at NETL working on high temperature sensor materials for gas sensing applications in advanced fossil energy applications. Paul received a dual bachelor's degree in engineering physics and economics from the University of Pittsburgh. He then moved on to Carnegie Mellon University where he received his PhD in materials science and engineering. Paul spent several years in new product development working on large area sputtered thin film coatings for energy efficient window applications. He joined NETL in early 2010 and spent a short time as a project manager for the Solid State Energy Conversion Alliance program prior to taking his current position.

REGINA WOLOSHUN

Senior

Major: Biochemistry

Minor: Mathematics

Saint Vincent College, Latrobe, PA

Mentor: Christina Myers

BIOGRAPHY

Regina Woloshun attends Saint Vincent College in Latrobe, PA, where she is earning her BS in Biochemistry with a minor in Mathematics. She participated in undergraduate research in Microbiology at Saint Vincent College, under the direction of Dr. Koehl. Regina will graduate in the spring of 2015 and plans on obtaining a career in Research and Development. She also plans to attend graduate school in the future. Ms. Woloshun's career aspirations include becoming a nutritional chemist.

PROJECT	DETERMINING THE RELATIONSHIP BETWEEN TORQUE AND VISCOSITY IN A RC1 SCALE-UP REACTOR, AND THE POTENTIAL APPLICATIONS IN SYNTHESIS, ENGINEERING, AND CARBON DIOXIDE CAPTURE MATERIALS
SITE	NATIONAL ENERGY TECHNOLOGY LABORATORY, PITTSBURGH, PA

Viscosity is an important property that offers insight into materials behavior. Viscosity is a critical element in designing a process and has direct impact on the efficiency of a process. Viscosities of various materials are engineered to deliver optimum process efficiency. In this study, we will correlate the torque of a rotor with viscosity using different rotor speeds on a RC1 scale-up reactor. Calibration curves will be generated using silicone oils with known viscosities. By determining a relationship between torque and viscosity for a specific set of conditions, the calibration curves can be used to approximate viscosity of new materials, and note changes during gas uptake experiments with CO_2, N_2, and H_2. This study can deliver a powerful tool for evaluating materials properties for CO_2 capture.

MENTOR

Christina Myers is the principle investigator of membrane technology for gas separation under the Functional Materials Development Division at the Department of Energy's National Energy Technology Laboratory, Pittsburgh, PA. She is a graduate of University of Pittsburgh, Pittsburgh, PA where she earned a Bachelor's and Master's degree both in Chemical Engineering. Her current work focuses on using ionic liquids on varying polymeric supports for CO_2 separation and capture in gasification processes. Ms. Myers has over 27 years of combined Federal service investigating various technologies addressing numerous areas of environmental impact.

FE LEADERSHIP

Christopher A. Smith

Serena A. McIlwain

Scott Klara

ENERGY

FELLOWSH
e Energy

OFFICE OF FOSSIL ENERGY

FE Leadership

CHRISTOPHER A. SMITH

Principal Deputy Assistant Secretary

OfFice of Fossil Energy

U.S. Department of Energy

Christopher Smith is Principal Deputy Assistant Secretary for Fossil Energy with responsibilities for office operations and managing the oversight of Fossil Energy's Research and Development program (encompassing coal, oil and natural gas) and the U.S. Petroleum Reserves. He was appointed to the Department of Energy in 2009 as Deputy Assistant Secretary for FE's Office of Oil and Natural Gas. Smith served as the Designated Federal Official for the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, established by President Obama to investigate the root causes of the Gulf oil spill.

Prior to his appointment in October of 2009, Smith served in managerial and analytical positions of increasing responsibility in the private sector. Most recently he spent eleven years with two major international oil companies focused primarily on upstream business development and LNG trading, including three years negotiating production and transportation agreements in Bogotá, Colombia.

Smith began his career as an officer in the U. S. Army and served tours in Korea and Hawaii. He subsequently worked for Citibank and JPMorgan in New York City and London in the area of emerging markets and currency derivatives.

Smith holds a bachelor's degree in Engineering Management from the United States Military Academy at West Point and an MBA from Cambridge University.

Smith is married to Dr. Patricia Smith. They reside in Alexandria with their two children.

OFFICE OF FOSSIL ENERGY

FE Leadership

SERENA A. MCILWAIN

Chief Operating Officer for Business Operations

Office of Fossil Energy

U.S. Department of Energy

Serena McIlwain is the Chief Operating Officer in the Immediate Office of the Assistant Secretary for Fossil Energy at the Department of Energy. In this role, she manages the business operations to include Communication/Public Affairs, Information Technology, Management and Field Operations, Environmental, Security, Safety and Health, Budget and Financial Management, and the Lean Six Sigma program for Fossil Energy. Serving as as the primary advisor to the Principal Deputy and Assistant Secretary of Fossil Energy, she orchestrates the day-to-day operations and management of administrative programs. Over the past 26 years, Ms. McIlwain has served as a public servant and has worked in numerous federal agencies in both the executive and legislative branches of government. This includes serving as the Director of Workforce Planning and Management at the Architect of the Capitol; Special Advisor to the Associate Director of Administration at the National Institutes of Health; Senior Management Analyst for Resource Management at the Drug Enforcement Administration - DEA; and Special Assistant to the Chief Associate Director at the Bureau of the Census.

Notable accomplishments include co-leading the federal-wide initiative to professionalize the Human Resources Career field which resulted in the creation of the HR University (HRU). The HRU saved the federal government millions of dollars, winning numerous awards in both the private and federal sector. Ms. McIlwain was one of the first professionals to launch the first federal Workforce Planning initiative. Specifically, she developed the federal government's first "workforce planning guide" at the National Institutes of Health which has been used as a model by many federal agencies. Ms. McIlwain also worked in DOE's Office of the Chief Human Capital Officer and served as the first Director to lead the Business Partners Office. She was responsible for cultivating business partnerships with the Program and Staff Offices within the Department to ensure Human Capital strategies were parallel to the Department's mission, goals, and objectives. Ms. McIlwain served as a Fellow on Capitol Hill in the office of Congressman Louis Stokes, serving in a staff role for the Appropriations Committee. She holds a Master of Public Administration (MPA) from George Mason University and a Master of Science (MSA) in Administration from Central Michigan University.

OFFICE OF FOSSIL ENERGY

FE Leadership

SCOTT KLARA

Deputy Director

National Energy Technology Laboratory

Office of Fossil Energy

U.S. Department of Energy

Mr. Klara is currently the Acting Director of NETL where he is responsible for managing the day-to-day execution for all aspects of the Laboratory's mission. He has over twenty nine years of diversified engineering and management experience that spans a broad spectrum of technology areas including: electric power generation; advanced separation processes; process control; coal conversion processes; and simulation/systems analysis. Mr. Klara has seven years of industry experience with AT&T Technologies - Bell Laboratories and Calgon Carbon Corporation. He has twenty two years of federal government experience with NETL and its' predecessor organizations. He holds B.S. and M.S. degrees in chemical engineering and an M.S. degree in petroleum engineering from the University of Pittsburgh. He is a registered professional engineer in chemical engineering in the states of Pennsylvania and West Virginia.

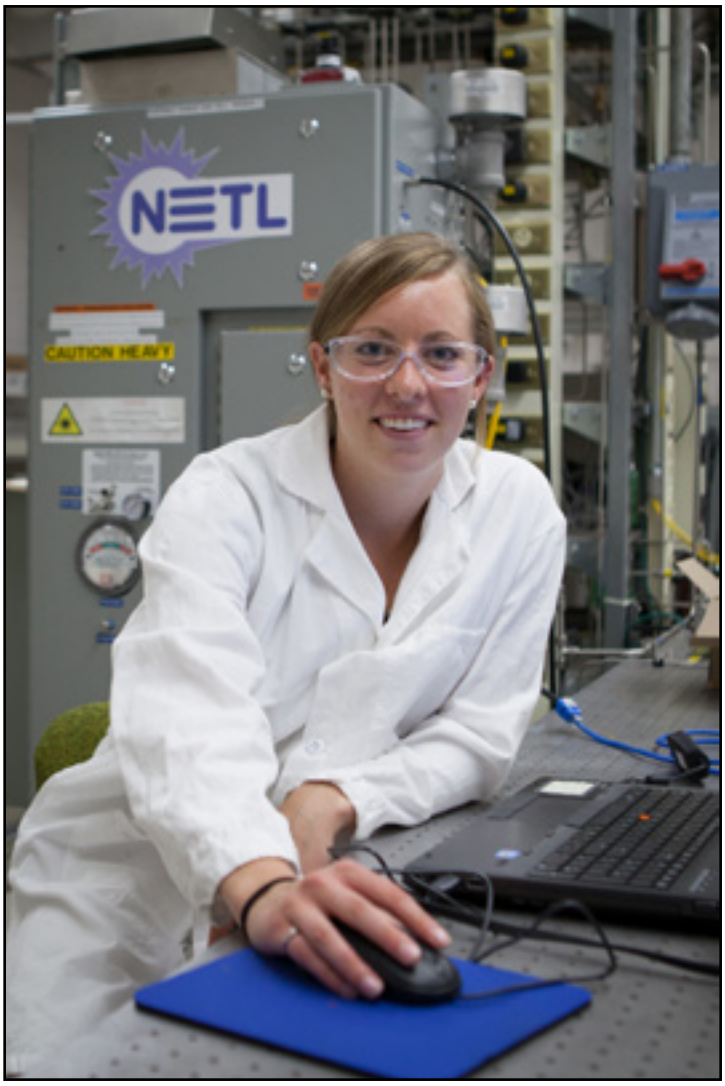
PROGRAM COORDINATORS

Alan F. Perry

Barbara Dunkin

Leslie Fox

1200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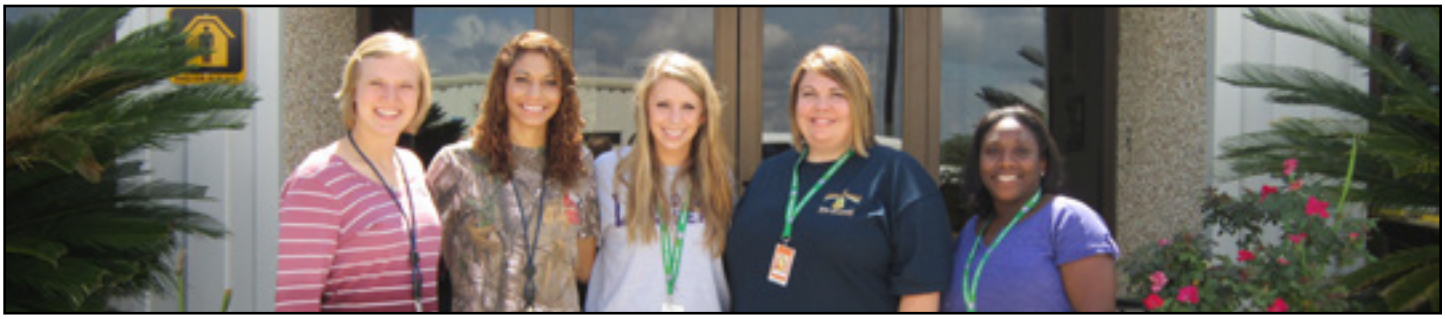


OFFICE OF FOSSIL ENERGY
Program Manager

ALAN F. PERRY

Acting Director

Office of Management and Field Operations

Office of Fossil Energy

U.S. Department of Energy

Alan Perry is currently the Acting Director for the Office of Management & Field Operations in the Office of Fossil Energy. In this capacity, Alan reports to the Chief Operating Officer for Business Operations and is responsible for advising the Chief Operating Officer and Deputy Assistant Secretaries on management, policy and organizational issues, human resource management and other administrative issues. Alan started his career as an intern with DOE while earning his Master's degree in Business Administration. He now has over 20 years of experience in Federal HR and business operations with an emphasis on implementing business process reforms and improving customer service. This is his second year managing the Mickey Leland Energy Fellowship for Fossil Energy. Alan grew up in the Washington, DC area, roots for his hometown Boston Red Sox, and attended the University of Maryland. He enjoys playing softball and volleyball and hopes to see more of the world in future travels. He currently lives in Rockville with his two children and Morkie named Watson.

OAK RIDGE ASSOCIATED UNIVERSITIES

BARBARA DUNKIN

Project Specialist, Science Education Programs

Oak Ridge Associated Universities

Barbara holds the position of program specialist at ORAU located in Oak Ridge, TN. For the last nine years, she has assisted with the administration of a wide variety of Department of Energy programs throughout the United States, including the Mickey Leland Energy Fellowship (MLEF) Program. Barbara specializes in client service and, when not assisting interns, she enjoys spending time with her children and grandchildren.

LESLIE FOX

Project Manager, Science Education Programs

Oak Ridge Associated Universities

Leslie is a project manager for ORAU located in Oak Ridge, TN. She is experienced in business and career development, educational and corporate project management, recruiting and event planning. As an ORAU project manager, she administers appointments for multiple Department of Energy programs throughout the United States, including programs at Oak Ridge National Laboratory (ORNL) and the Mickey Leland Energy Fellowship (MLEF) Program. Prior to joining ORAU in 2010, Leslie served as the engineering career consultant for the University of Tennessee working with over 500 corporations and government agencies and was the Tusculum College director for the first non-traditional career services program in the region serving over 2,500 students on four campuses.

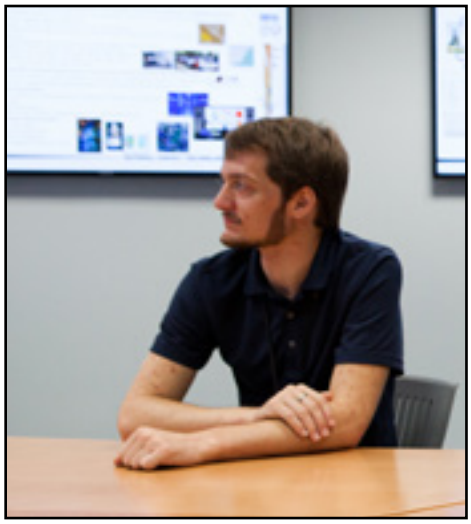
SITE COORDINATORS

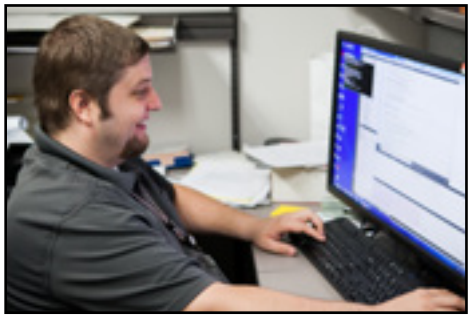
Nancy Andres

Dani Petrucci

Elaine King

Kelly Schwehm





NATIONAL ENERGY TECHNOLOGY LABORATORY

NANCY ANDRES

Site Coordinator

Program Analyst, ECO Team

Office of Research & Development

Nancy Andres is a member of the Education, Collaboration, and Outreach team in NETL's Office of Research and Development. She manages post-secondary education and outreach programs for NETL. She serves as the site coordinator for the Albany, Oregon; Morgantown, WV; and Pittsburgh, PA sites. This is her fourth year of involvement with the Mickey Leland Energy Fellowship Program.

OFFICE OF FOSSIL ENERGY

DANI PETRUCCI

Mentor

General Engineer

U.S. Department of Energy

Ms. Petrucci attended Penn State University and received a Bachelor of Science Degree in Energy Engineering, with a minor in Environmental Engineering, in May 2010. She began working for the US Department of Energy (DOE) in 2008, when she was accepted into DOE's Technical Career Internship Program. She interned in Washington, DC in the summer of 2008 in the Office of Fossil Energy, Office of Planning and Environmental Analysis. In the summer of 2009, she interned in Germantown, MD in the Office of Fossil Energy's Office of Sequestration, Hydrogen, and Clean Coal Fuels. She began working full-time at DOE Headquarters in June 2010 in the Office of Fossil Energy, Division of Carbon Capture and Storage Research and Development. At Penn State, she studied various energy systems, including fossil fuels, renewable energy, and nuclear energy. At DOE, she has primarily been focused on coal power systems and greenhouse gas emissions reduction research, specifically the processes of carbon capture, utilization, and storage (CCUS). She just recently received a Master of Science degree in Technical Management from Johns Hopkins University.

PACIFIC NORTHWEST NATIONAL LABORATORY

ELAINE KING

Site Coordinator

Organizational Development Division

Office of Work Based Learning

Elaine King is an Education Consultant at Pacific Northwest National Laboratory (PNNL) in Richland, WA. She is a graduate of the University of Puget Sound in Tacoma, WA where she earned a Bachelor's degree in Psychology. She is a program manager managing several Department of Energy (DOE) educational programs for undergraduate students and faculty as well as site coordinator for the Department of Homeland Security Program and coordinator of the DOE Regional High School Science Bowl competition. She is an advocate for those historically underrepresented in scientific and technical fields and promotes and participates in local and regional Science Technology Engineering Math (STEM) education outreach. She began her career at PNNL in 2001 following a ten-year career in community college administration, marketing and recruiting, and non-profit educational management.

STRATEGIC PETROLEUM RESERVE

KELLY SCHWEHM

Site Coordinator

General Engineer

New Orleans, LA

Kelly Schwehm is a General Engineer in the Site Operations & Maintenance Division of the Department of Energy's Strategic Petroleum Reserve (SPR). She received both her Bachelor of Science in Mechanical Engineering (2002) and Master of Business Administration (2007) from the University of New Orleans. She has been with the SPR's New Orleans office for 8 years (4 years in Quality Assurance and 4 years in Site Operations and Maintenance). This is her fourth year serving as a Mickey Leland Energy Fellowship Program site coordinator. She currently enjoys reading, going to see live music, and playing with her six cats.

Mickey Leland Energy Fellowship
Internship Program

For more information please contact:

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Washington, DC 20585
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U.S. Department of Energy

Office of Fossil Energy

National Energy Technology Laboratory

Pacific Northwest National Laboratory

Strategic Petroleum Reserve

Oak Ridge Associated Universities

U.S. DEPARTMENT OF ENERGY

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