THE UNIVERSITY OF TOLEDO

Oct 10, 2019
Registration & Coffee (8-8:45 AM) – Nitschke (NI) Hall, 1st floor lobby

Plenary - NI Auditorium

- **Introduction & Welcome** (8:45-9:00 AM)
  Dr. Sharon Gaber, President of The University of Toledo

- **Opening Remarks** (9:00-9:30 AM)
  The Honorable Marcy Kaptur
  DOE Leadership Representative

- **Introduction to Lab 101 Panels**
  Andrew Deye, Managing Director, Strategy & Business Development, JobsOhio

- _**National Lab 101, Panel #1**_ (9:30-10:45 AM)
  Supporting the Nation's Scientific Ecosystem - A roundtable discussion about the national laboratories' user facilities, educational opportunities, and core research programs.

Moderators	Karen Bjorkman, Interim Provost, University of Toledo
	Michael Witherell, Director, Lawrence Berkeley National Laboratory (LBNL)
Panelists	Doon Gibbs, Director, Brookhaven National Laboratory (BNL)
	Stuart Henderson, Director, Jefferson National Accelerator Laboratory
	Thom Mason, Director, Los Alamos National Laboratory (LANL)
	Steven Ashby, Director, Pacific Northwest National Laboratory (PNNL)

Break (10:45-11:00 AM) NI, 1st floor lobby

- _**National Lab 101**_, Panel #2 (11:00 AM-12:15 PM)
  Moving Solutions to Society - A roundtable discussion about how the national laboratories work with universities, industry, and governments to move technology to society.

Moderators	Frank Calzonetti, VP for Research, University of Toledo
	Mark Peters, Director, Idaho National Laboratory
Panelists	Thomas Zacharia, Director, Oak Ridge National Laboratory (ORNL)
	Brian Anderson, Director, National Renewable Energy Laboratory (NREL)
	Bill Goldstein, Director, Lawrence Livermore National Laboratory (LLNL)
	Vahid Majidi, Director, Savannah River National Laboratory (SRNL)
	Paul Kearns, Director, Argonne National Laboratory ((ANL)

Lunch (12:15- 1:30 PM) – NI, 1st floor lobby
  Exhibition and Networking – exhibition of national scientific user facilities capabilities and expertise; fellowship, employment and educational opportunities.

Plenary (1:30-3:00 PM) – NI Auditorium
- ***The Land-Water Interface: The Great Lakes Region & the World***
  This session explores complex environmental challenges facing the Great Lakes region and that exist increasingly throughout the world. Special attention is on the challenge of harmful algal blooms in Lake Erie and factors that contribute to this problem, including the impact of a changing climate, nutrient loading into waterways, and human activities. The importance of understanding the terrestrial-aquatic interface is emphasized. The session explores how a better understanding of the relationship among climatic conditions and ecological variables provides guidance in addressing problems as well as preparing for biomes in transition. The session considers how such changes challenge land use practices in rural and metropolitan areas.
  Co-chairs   Tom Bridgeman, Professor, University of Toledo
                       Allison Campbell, Associate Laboratory Director (PNNL)
  Panelists   Phillip Wolfram, Scientist, (LANL)
                       Mary Maxon, Associate Laboratory Director, (LBNL)
                       Peter Thornton, Distinguished Scientist, (ORNL)

Break (3:00-3:15 PM) NI, 1st floor lobby

Simultaneous Breakout Sessions (three topics) (3:15-4:45 PM) NI Auditorium / NI 1027 / Brady Center
- ***Sustainability and Life Cycle Assessment***
  This session explores how emerging science, tools and technologies can be used to create more sustainable products that promote resilient human and natural systems. Examples of emerging decision-making tools include network analysis, advances in life cycle assessment, and other integrated modeling approaches that fully consider human and natural systems to address short- and long-term disturbances, feedback loops, and even planetary thresholds (absolute sustainability). We will explore how these tools can be used to evaluate the role of new technologies in creating sustainable and resilient systems, with special emphasis on circular economy approaches for solar PV panels and plastics.
  Co-chairs   Defne Apul, Professor, University of Toledo
                       Timothy Skone, Lead, Life Cycle Analysis Team (NETL)
  Panelists   Garvin Heath, Senior Scientist, Resources and Sustainability Group in the Strategic
                       Energy Analysis Center (NREL)
                       Babetta L. Maronne, Senior Scientist, Bioscience Div. (LANL)
                       Amgad Elgowainy, Team Leader/Principal Energy Systems Analyst (ANL)

- ***Structural Biology Imaging and Spectroscopy – from atomic to cellular scales***
  This session profiles high-resolution imaging techniques in biological systems over multiple length scales. Techniques can provide temporal information for targets of interest in medicine and microbial ecology. Foci are protein - receptor interactions, cell structure and biological response to the physical and chemical environment. Techniques include cryo-EM, high resolution X-ray crystallography, IR spectromicroscopy using synchrotron radiation, and high-field NMR.
  Co-chairs   Isaac Schiefer, Associate Professor, University of Toledo
                       John Hill, Deputy Assoc. Laboratory Director for Energy and Photon Sciences, BNL
  Panelists   Carolyn Larabell, Director, National Center for X-ray Tomography; Faculty Scientist,
                       Molecular
                       Biophysics & Integrated Bioimaging Div. (LBNL)
                       Wah Chiu, Director CryoEM and Bio-imaging Div. (SLAC); Professor, Stanford University
                       Andrzej Joachimiak, Argonne Distinguished Fellow, Director of Structural Biology Center;
                       Co-Director for Structural Genomics of Infectious Diseases (ANL)

- ***Astrophysics***
  Our understanding of origins, evolution, and structure in the Universe — from the widest cosmic scales, to galactic ecosystems, to the formation of individual stars — is poised for a great leap forward in the next several decades. The coming wave of advanced ground- and space-based observational facilities, large scale spectroscopic and time-domain surveys, advanced data exploration methodologies, and powerful new computational frameworks will greatly extend our reach, helping us answer fundamental questions about the Universe. This session will focus on simulations of the first stars and black holes in the early Universe, the impact of accreting black holes on the evolution of galaxies, and the formation, evolution and role of stellar clusters as the basic units of star formation.

Co-chairs	JD Smith, Professor, University of Toledo
	Nick Gnedin, Senior Scientist, Theoretical Astrophysics group (FNL)
Panelists	Peter Nugent, Department Head for Computational Science, Lawrence Berkeley National Lab (LLBL)
	Jarrett Johnson, Scientist, Los Alamos National Lab (LANL)
	Risa Wechsler, Scientist (SLAC)

Reception & Networking: (5:00-6:30 PM) – Nitschke Hall, 1st floor lobby

Oct 11, 2019

Coffee (7:30-8 AM) – NI, 1st floor lobby

Simultaneous Breakout Sessions (three topics) (8-9:30 AM) NI Auditorium / NI 1027 / Brady Center
- ***Exposure Science – 'Omics' Applications for Human Health, Ecology and Environmental Science***
  Humans are exposed to, or intake, food, water, air, and other environmental agents on a daily basis. At the same time, humans release non-natural substances to the environment, including personal care products, and prescription and illicit drugs. The combination of these exposures can exert profound effects on human and environmental health. This session explores the contact of humans or other organisms with chemical, physical, and biologic stressors and their fate in living systems. Through exposure science and modern toxicology, we will explore how advanced 'Omics' approaches can help us understand stressors that affect human and ecosystem health and interface with sensor systems, analytical methods, molecular biology, computational tools, and bioinformatics.

Co-chairs	David Kennedy, Assistant Professor, University of Toledo
	Kenneth Turteltaub, Division Leader, Biosciences & Biotechnology, (LLNL)
Panelists	Srinivas Iyer, Bioscience Div. Leader, Los Alamos National Lab (LANL)
	Crystal Jaing, Group Leader, Applied Genomics, Biosciences and Biotechnology Div. (LLNL)
	Hoi-Ying Holman, Director, Berkeley Synchrotron Infrared for Structural Bioimaging (LBNL)
	Justin G. Teeguarden, Chief Scientist, Exposure Science; Deputy Director for Science, Environmental and Molecular Sciences Lab (PNNL)

- ***Materials & Manufacturing***
  This session explores a variety of approaches for the development of advanced materials and manufacturing technologies. Special focus is on the progress of additive manufacturing techniques, which are used to "print" a wide spectrum of functional components; design and synthesis of heterogeneous catalysts for accelerated chemical reactions; and fabrication of membranes for effective separations and fuel cell technologies. Topics include modeling and simulation, synthesis and fabrication, and ex-situ and in-situ characterization techniques for structure-property correlations to applications.

Co-chairs	Ana Alba-Rubio, Assistant Professor, University of Toledo
	Tanja Pietrass, Division Leader, Materials Physics & Applications, (LANL)
Panelists	Christopher Spadaccini, Director, Additive Manufacturing Initiative, Center for Engineered Materials and Manufacturing, (LLNL)
	Rebecca Fushimi, Senior Research Scientist, Biological & Chemical Science & Engineering (INL)
	E. Andrew Payzant, Materials Engineering Group Leader, Neutron Scattering Div., (ORNL)

- ***Photovoltaics***
  In 2011, the DOE announced the SunShot program with the goal of making solar electricity price-competitive with conventional utility sources by 2020. The combined effort from national labs, universities, and industry allowed the goal for utility-scale photovoltaics to be reached three years early. As a result, a new goal has been established: to reduce the cost of solar by an additional 40% to 70% beyond 2018 costs by 2030. This session will explore the development of avenues that have the potential to reach this goal, with a focus on device and module efficiency, manufacturing, and reliability.

Co-chairs	Michael Heben, Professor, University of Toledo
	Wyatt Metzger, Thin-Film Material Science and Processing, (NREL)
Panelists	Anthony Martino, Program Manager Photovoltaics & Materials Div., Sandia National Lab (SNL)
	Joseph Berry, Senior Scientist, Team Lead, Perovskite & Hybrid Solar Cells, (NREL)
	Dirk Weiss, Technology Assessment & Scouting, First Solar

Break (9:30-9:45 AM) NI, 1st floor lobby

Simultaneous Breakout Sessions (three topics) (9:45-11:15 AM) NI Auditorium / NI 1027 / Brady Center

- ***Microbial Ecology***
  There is a critical need to understand the function and role of microbial communities and how they control biogeochemical responses to a wide variety of changes in environmental conditions. This understanding is necessary for everything from predicting ecosystem responses to warming to achieving environmental contaminant remediation. The session goal is to explore methodologies and tools to improve our predictive understanding of the roles of microbial communities in mediating carbon and nutrient fluxes, contaminant remediation and other critical biogeochemical processes, as well as using microbial systems as sentinels of environmental threats and perturbations. This includes integrated lab and field experiments, coupled with a sophisticated suite of biochemical and chemical analyses, to determine the molecular mechanisms governing microbial decomposition, biogeochemical cycling and synthesis into microbial-explicit models.
  Co-chairs   Michael Weintraub, Professor, University of Toledo
  Aindrila Mukhopadhyay, Senior Scientist, Biological Systems & Engineering, LBNL
  Panelists   Janet Jansson, Chief Scientist & Laboratory Fellow, Biological Sciences Div. (PNNL)
  Srinivas Iyer, Bioscience Div. Leader (LANL)
  Jonathan Allen (LLNL)

- ***Molecular Structure & Dynamics: molecular interactions in solutions, nanoparticles and at interfaces***
  Molecular structure and interactions underlie the properties and performance of natural and engineered systems, including living organisms, chemical technologies, and advanced materials. This session focuses on characterizing how the chemical structure affects intermolecular interactions in solution, colloidal and interfacial, and biological processes. These include biomolecular binding, small molecule and polymer self-assembly, phase transitions (e.g., condensation, evaporation and crystallization/precipitation), and multiphase processing.
  Co-chairs   Yakov Lapitsky, Professor, University of Toledo
  Jeffrey Nelson, Manager, Center for Integrated Nanotechnologies (SNL)
  Panelists   Susan Rempe, Distinguished Member of the Technical Staff, Sandia National Laboratory (SNL)
  Volker Urban, Instrument Scientist, High Flux Isotope Reactor, Oak Ridge National Lab (ORNL)
  Xiao-Min Lin, Scientist, Center for Nanoscale Materials (ANL); Fellow, James Franck Institute, University of Chicago

- ***Energy Storage & Distribution***
  Energy storage and distribution are critically important components for the future of transportation and the electric grid. Developing low-cost, reliable, energy-dense and safe energy storage and grid solutions for the future requires catalyzing breakthroughs in materials science, interfacial reactions and transport processes, and advances in manufacturing methodologies. This session will explore how advanced experimental and theoretical capabilities can accelerate materials discovery and the control over transport and reactions at many length-scale to enable the design and scale-up of the next-generation of energy storage and grid solutions.

Co-chairs	Rohan Akolkar, Professor, Case Western Reserve University
	Lei Cheng, Chemist, Materials Science Div. (ANL)
Panelists	Vince Sprenkle, Sr. Technical Advisor – Energy Storage, (PNNL)
	Anthony Burrell, Research Advisor II, Materials Science (NREL)
	Amy Marschilok, Scientist, Energy Sciences Directorate (BNL)
	Anthony Van Buuren, Deputy Div. Leader, Materials Science Div. (LLNL)

Break (11:15-11:30 AM) NI, 1st floor lobby

Plenary Panel (11:30 AM – 1:00 PM) – NI Auditorium or NI 1027
- ***High Performance Computing Addressing Critical Issues for Northwest Ohio***
  The DOE national laboratories' suite of HPC assets and deep bench of computing experts and computational infrastructure are available for researchers throughout the country. This session will explore and provide examples of how DOE's computing and computational resources can be applied to issues critical to Ohio universities and Northwest Ohio. These include development of next generation photovoltaics, gaining a better understanding of watershed dynamics and forecasting, and addressing major health issues.

Co-chairs	Yanfa Yan, Professor, University of Toledo
	Jack Wells, Director of Science, National Center for Computational Sciences, ORNL
Panelists	Irene Qualters, Associate Laboratory Director for Simulation and Computation (LANL)
	Michael Zarnstorff, Laboratory Chief Scientist, Princeton Plasma Physics Laboratory (PPPL)
	Sudip Dosanjh, Div. Director, National Energy Research Scientific Computing Center (NERSC) (LBNL)