

## THURSDAY, OCTOBER 14 (Pre-Symposium Session)

**\*\*Note that Registration for this Session is Separate from the Rest of the Event\*\***

**\*\*Link to Register- [Go To Meeting Link](#)\*\***

11:00-11:10	The Intersection of AI/ML and Resiliency	Curtis Smith, INL
11:10-11:40	AI for Energy System Resilience	Liang Min, Stanford University
11:40-11:50	Support Vector Analysis for Computational Risk Assessment, Decision-Making, and Vulnerability Discovery in Complex Systems	Andrei Gribok, INL
11:50-12:00	Building Resilience into AI/ML solutions	Char Sample, INL
12:00-12:20	Foundations of Resilience: Transformation of Cross-Disciplinary Collaboration in Dialogue and Tools	Craig Rieger, INL
12:20-12:30	ML-Driven Prognostics and Health Management: Opportunities and Challenges for Nuclear Industry	Xingang Zhao, ORNL
12:30-12:40	Explainable and Trustworthy Diagnostics Achievable Through Process-Based Automated Reasoning	Roberto Ponciroli, ANL
12:40-12:50	Resilience-friendly features of NAMAC	Paridhi Athe, NCSU
12:50-1:00	Resilience of Federated Transfer Learning	Vivek Agarwal, INL

## MONDAY, OCTOBER 18 (Pre-Symposium Workshops)

10:45 – 11:00 ET	Welcome – Ethan Huffman		
11:00 – 12:30 ET	<b>SESSION 1</b>		
	<p><b>TRACK 1:</b> <i>Societal Benefits of Resilience/What does Resilience Mean to you</i></p> <p><u>Chair</u> Bobby Jeffers, SNL</p> <p><u>Presenters</u> Amanda Wachtel, SNL Susan Spierre-Clark, U Buffalo Pete Larsen, LBNL</p>	<p><b>TRACK 2:</b> <i>Community &amp; Infrastructure Modeling Tools: Interdependent Networked Community Resilience Modeling Environment (IN-CORE)</i></p> <p><u>Chairs</u> Craig Rieger, INL; Kevin Schultz, JHUAPL; Stephanie Pilkington, UNCC, Tim McJunkin INL; Char Sample, MTSI</p> <p><u>Presenter</u> Jong Sung Lee, U. Ill. UC</p>	<p><b>TRACK 3:</b> <i>Power Grid Resilience: Needs and challenges</i></p> <p><u>Chairs</u> Mohammed Ben-Idris, UNR Anurag Srivastava, WVU</p>
12:30-1:30 ET	Lunch Break		
1:30 – 3:00 ET	<b>SESSION 2</b>		
	<p><b>TRACK 1:</b> <i>The Heat is on – An Interactive Cyber Exercise</i></p> <p><u>Chairs/Presenters</u> Kimberly Denbow, AGA Jon Monken, Converge Strategies</p>	<p><b>TRACK 2:</b> <i>Community &amp; Infrastructure Modeling Tools: All Hazards Analysis</i></p> <p><u>Chairs</u> Craig Rieger, INL; Kevin Schultz, JHUAPL; Stephanie Pilkington, UNCC, Tim McJunkin INL; Char Sample, MTSI</p> <p><u>Presenter</u> Ryan Hruska, INL</p>	<p><b>TRACK 3:</b> <i>Power Grid Resilience: Definitions, metrics, and tools</i></p> <p><u>Chairs</u> Mohammed Ben-Idris, UNR Anurag Srivastava, WVU</p>
3:00 – 4:30 ET	<b>SESSION 3</b>		

<p><b>TRACK 1:</b> <i>DOE GMLC Resilient Distribution Systems (RDS) Projects – What we learned and what’s next</i></p> <p><u>Chairs</u>                  Abraham Ellis, Sandia                  Emma Stewart, NRECA</p> <p><u>Panelists</u>                  Clay Koplin, CEC                  Kevin Schneider, PNNL                  David Lovelady, Sandia</p>	<p><b>TRACK 2:</b> <i>Community &amp; Infrastructure Resilience Modeling and Simulation Needs/Challenges</i></p> <p><u>Panelists</u>                  Ryan Hruska, INL                  Jamie Kruse, East Carolina U                  Thomas Overby, Texas A&amp;M                  John Van de Lindt, CSU</p> <p><u>Moderator</u>                  Stephanie Pilkington, UNCC</p>	<p><b>TRACK 3:</b> <i>Gaining Consensus on Power Grid Resilience Metrics (brainstorming)</i></p> <p><u>Chairs</u>                  Mohammed Ben-Idris, UNR                  Anurag Srivastava, WVU</p>	
<p><b>4:30-6:00 ET</b></p>		<p><b>SESSION 4</b></p>	
<p><b>TRACK 1:</b> <i>Domain Components of the Impending Cyber-Physical Energy System Transformation</i></p> <p><u>Chair</u>                  Paul Roege, Typhoon-HIL</p> <p><u>Presenters</u>                  Rob Hovsopian, NREL                  Charles Forsberg, MIT                  Sarah Davis, SRD Consulting</p>	<p><b>TRACK 2:</b> <i>IN-CORE and AHA Interactive Session</i></p> <p><u>Chairs</u>                  Craig Rieger, INL; Kevin Schultz, JHUAPL;                  Stephanie Pilkington, UNCC, Tim McJunkin INL; Char Sample, MTSI</p> <p><u>Presenters</u>                  Ryan Hruska, INL                  Jong Su Lee, U. Ill. UC</p>	<p><b>TRACK 3:</b> <i>Tools for Enabling Power Grid Resilience (Brainstorming)</i></p> <p><u>Chairs</u>                  Mohammed Ben-Idris, UNR                  Anurag Srivastava, WVU</p>	

**TUESDAY, OCTOBER 19 (FED Day)**

<p><b>10:45-11:00 ET</b></p>	<p>Welcome – Ethan Huffman</p>	
<p><b>11:00 – 12:30 ET</b></p>	<p><b>Plenary Speaker 1</b> –Rieger, Idaho National Laboratory  <b>Plenary Speaker 2</b> – TBA                  Introduction of Senator James Risch - TBA  <b>Plenary Speaker 3</b> – Senator James E. Risch</p>	
<p><b>12:30-12:45 ET</b></p>	<p>Break</p>	
<p><b>12:45 – 2:15 ET</b></p>		<p><b>SESSION 1</b></p>
<p><b>TRACK 1:</b> <i>Energy Efficiency and Renewable Energy Resilience Thrusts WETO/SETO/WPTO</i></p> <p><u>Chair</u>                  Tim McJunkin, INL</p> <p><u>Panelists</u>                  David Walter, Solar Energy                  Ben Ollis, ORNL                  Hill Balliet, Water Power                  Abhishek Somani, PNNL                  Bret Barker, Wind Energy                  Megan Culler, INL</p> <p><u>Moderator</u>                  Brian Seal, EPRI</p>	<p><b>TRACK 2:</b> <i>Invited Session</i></p> <p><u>Chair</u>                  Justin Welch, INL</p>	<p><b>TRACK 3:</b> <i>Cyber City: A Platform for Researching Critical Infrastructure Resilience</i></p> <p><u>Chair/Presenter</u>                  Candice Mitchell, US Army Corps of Engineers</p>

2:15 – 2:30 ET	Lunch Break		
2:45 – 3:45 ET	<b>SESSION 2</b>		
<p><b>TRACK 1: Energy Transition Initiative EERE/OE (ETIPP)</b></p> <p><u>Chairs</u>                  Stephen Walls, DOE OE; Abraham Ellis, Sandia</p> <p><u>Panelists</u>                  Aaron Ng, DOE ETI Program                  Mark Glick, HNEI                  Erin Whitney, AECF                  Rob Cox, Coastal Studies Institute</p>	<p><b>TRACK 2: DOD Achieving Resilience for Control Systems Across Government-owned and Commercially-owned Assets</b></p> <p><u>Chair</u>                  Aleksandra Scalco, US Navy</p> <p><u>Panelists</u>                  DHS CISO Kenneth Bible (SES) (DHS mission)                  NSA Michael Dransfield (SES) (control systems)                  ASN EIE Sandra Kline (SES) (Navy installations)                  OSD Policy Daryl Haegley (DOD Mission/Policy)                  NAVFAC DCIO/CTWH Michael Kilcoyne (Navy Cybersecurity for control systems)</p>	<p><b>TRACK 3: The National Cybersecurity Workforce Development Program: An Innovative and Scalable Framework to Expand the Critical Infrastructure Security Human Capital</b></p> <p><u>Chair</u>                  Eman El-Sheikh, Univ. of West FL</p> <p><u>Panelists</u>                  Diane M. Janosek, NSA                  Eman El-Sheikh, Univ. of West FL                  Dipankar Dasgupta, Univ. of Memphis                  Art Conklin, Univ. of Houston</p>	
3:45 – 4:00 ET	Break		
4:00 – 5:00 ET	<b>SESSION 3</b>		
<p><b>TRACK 1: Prognostic sensing and modeling for resilient management of extreme events</b></p> <p><u>Chair</u>                  Kris Villez, ORNL</p> <p><u>Panelists</u>                  Bear Prairie, Idaho Falls Power                  Mohammed Ben-Idris, Univ. of NV</p>	<p><b>TRACK 2: DoD -All Hazards Analysis (AHA) presented with the Army Cyber Institute (ACI)</b></p> <p><u>Chair</u>                  Tim Klett, INL</p>	<p><b>TRACK 3: Cybersecurity Workforce Development for Rural Distribution Utilities: Challenges and Solutions</b></p> <p><u>Chair</u>                  Abraham Ellis, Sandia</p> <p><u>Panelists</u>                  Olga Lavrova, NNMSU                  Delaine Orendorff, NRECA                  Keven Groenwold, NMRECA</p>	
5:00 – 5:15 ET	Break		
5:15 – 6:15 ET	<p><b>Research Poster Presentations</b></p> <p><i>*Note: The authors will formally present their posters at the times listed, however they will be available to chat for the entire hour.</i></p> <p><u>Posters</u></p> <ul style="list-style-type: none"> <li>• 5:15 - Extensive resilience analysis of function models of complex systems, Yann Guillouet, German Aerospace</li> <li>• 5:20 - Cyber-Physical Security Assessment and Resilience of a Microgrid Testbed, Theron Beam, BSU</li> <li>• 5:25 - COVID Response: A Blended Approach to Studying Sanitizer Station Deployment at Clemson University, Tyler O'Brien, Clemson University</li> <li>• 5:30 - A Co-Simulation Approach to Modeling Electric Vehicle Impacts on Distribution Feeders During Resilience Events, Thad Haines, Sandia</li> <li>• 5:35 - Enhancing the Operational Resilience of Advanced Reactors with Digital Twins by Recurrent Neural Networks, Linyu Lin, INL</li> <li>• 5:40 - Design of Resilient Electric Distribution Systems for Remote Communities: Surgical Load Management using Smart Meters, Mayank Panwar, NREL</li> <li>• 5:45 - Applying Utility's Advanced Grid Technologies to Improve Resiliency of a Critical Load, Charlie Vartanian, PNNL</li> <li>• 5:50 - A Deep-Defense Approach for Next-Gen Cyber-Resilient Inter-Dependent Critical Infrastructure Systems, Eman Hammad, Texas AM U - Commerce</li> </ul>		

## WEDNESDAY, OCTOBER 20 (Research Day)

10:45-11:00 ET	Welcome – Ethan Huffman Best Papers Announcement		
11:00 – 12:30 ET	<p><b>Plenary Speaker:</b> <i>Energy Transition</i>  <u>Speaker:</u> Kate Gordon, Senior Advisor to Secretary of Energy  <u>Interviewer:</u> Andy McIlroy, ALD for Energy and Homeland Security, Sandia National Laboratories</p> <p><b>Plenary Panel:</b> <i>How do we maintain or even improve resilience in the drive towards Net-zero carbon</i>  <u>Panelists:</u> Department of Energy Deputy Assistant Secretaries: Michael Pesin (OE), Alice Caponiti (NE), Alejandro Moreno (EERE)  <u>Moderator:</u> Amy Myers Jaffe, Managing Director of the Climate Policy Lab at The Fletcher School at Tufts University</p>		
12:30-12:45 ET	Break		
12:45 – 2:15 ET	<b>SESSION 1</b>		
	<p><b>TRACK 1:</b> <i>Autonomous Intelligence for Cyber-Defense Agents</i></p> <p><u>Chair</u> Nate Evans, ANL</p> <p><u>Presenters</u> Nate Evans, ANL Ben Blakely, Dwolla Paul Theorn, Thales S. Jay Lang, RIT Venkatramanan Subrahmanian, Northwestern Martin Drasar, Masaryk University</p>	<p><b>TRACK 2:</b> <i>Future Challenges in Human-Technology Integration: A Sponsor’s Perspective</i></p> <p><u>Chairs</u> Katya Le Blanc, INL; Corey Fallon, PNNL</p>	<p><b>TRACK 3:</b> <i>Convergence of Resilience and Equity</i></p> <p><u>Chair</u> Bobby Jeffers, Sandia</p> <p><u>Panelists</u> Forest Kaser, CPUC Shay Bahramirad, Quanta Technology Adaora Ifebigh, NRECA Kyle Spencer, City of Norfolk</p>
2:15-2:45 ET	Lunch Break		
2:45-3:45 ET	<b>SESSION 2</b>		
	<p><b>TRACK 1:</b> <i>Cognitive Systems Papers</i></p> <p><u>Chairs</u> Nathan Lau, VT; Katya Le Blanc, INL; Corey Fallon, PNNL</p> <ul style="list-style-type: none"> <li>• <i>A Methodology for Assessing Risk to Inform Technology Integration</i>, Corey Fallon, PNNL</li> <li>• <i>Exploration of Time-Based Resilience Measurements for Next Generation Combat Vehicle Teams</i>, Hudson Graham, ASU</li> </ul>	<p><b>TRACK 2:</b> <i>Cyber System Papers</i></p> <p><u>Chairs</u> Nate Evans, ANL; David Manz, PNNL; Char Sample, MTSI</p> <ul style="list-style-type: none"> <li>• <i>Continuous Infrastructure Assessment for Key Business Functions in Changing Environments</i>, Gabriel Weaver, UIUC</li> <li>• <i>A Cyber-Resilience Risk Management Architecture for Distributed Wind</i>, Megan Culler, INL</li> <li>• <i>Digital data provenance for the power grid based on a Keyless Infrastructure Security Solution</i>, Sri Nikhil Gupta Gourisetti, PNNL</li> <li>• <i>Leveraging STIX for Actionable Intelligence and Automated Response</i>, Christian Hunt, CSSRT</li> </ul>	<p><b>TRACK 3:</b> <i>Community/Infrastructure Papers</i></p> <p><u>Chairs</u> Raymond Byrne, Abraham Ellis, SNL; Stephanie Pilkington, UNCC</p> <ul style="list-style-type: none"> <li>• <i>Refueling Delay Models in Heterogenous Road Networks for Wireless Communications Base Station Gensets Operating in Extreme Conditions</i>, Vaidyanathan Krishnamurthy, UTA</li> <li>• <i>Statistical Evaluation of Flooding Impact on Power System Restoration Following a Hurricane</i>, Grant Cruse, UPitt</li> <li>• <i>Quantifying Resilience Value of Solar plus Storage in City of Reno</i>, Mohammed Ben Idris, UNR</li> </ul>

			<ul style="list-style-type: none"> <li>• <i>Resilient Recovery Features of Offshore Wind Farm with Maintenance Service</i>, Bartosz Skobie, GAC</li> </ul>
3:45-4:00 ET	Break		
4:00-5:00 ET	SESSION 3		
<p><b>TRACK 1: Control Systems Papers</b></p> <p><u>Chairs</u>                  Kris Villez, ORNL; Quanyan Zhu, NYU; Kevin Schultz, JHUAPL</p> <ul style="list-style-type: none"> <li>• <b>Novel Data Driven Noise Emulation Framework using Deep Neural Network for Generating Synthetic PMU Measurements</b>, Sri Nikhil Gupta, Gouriseti, PNNL</li> <li>• <i>Automatic Drift Correction through Nonlinear Sensing</i>, Kris Villez, ORNL</li> <li>• <i>Adaptive, Cyber-Physical Special Protection Schemes to Defend the Electric Grid Against Predictable and Unpredictable Disturbances</i>, Shamina Hossain-McKenzie, SNL</li> <li>• <i>Hierarchical Operation of Flexible Building Microgrids for Distributed Critical Loads Resiliency</i>, Manohar Chamana, TT</li> </ul>	<p><b>TRACK 2: Cyber Systems Papers</b></p> <p><u>Chairs</u>                  Nate Evans, ANL; David Manz, PNNL; Char Sample, DoD</p> <ul style="list-style-type: none"> <li>• <i>Chaos Engineering for Enhanced Resilience of Cyber-Physical Systems</i>, Charalambos Konstantinou, KAUST</li> <li>• <i>Data-Driven Suitability Analysis to Enable Machine Learning Explainability and Security</i>, Shaya Wolf, INL</li> <li>• <i>On the Limits of EM Based Detection of Control Logic Injection Attacks In Noisy Environments</i>, Konstantinos Koliass, UI</li> <li>• <i>Infrastructure eXpression for Codified Cyber Attack Surfaces and Automated Applicability</i>, Rita Foster, INL</li> </ul>	<p><b>TRACK 3: Communications Crossover Papers</b></p> <p><u>Chairs</u>                  Eyuphan Bulut, VCU; Kemal Akkaya, FIU; Brad Nelson, INL</p> <ul style="list-style-type: none"> <li>• <i>Modular Network Stacks in the Real-Time Executive for Multiprocessor Systems</i>, Vijay Banerjee, UC, Colorado Springs</li> <li>• <i>Analyzing Implicit Interactions to Identify Weak Points in Cyber-Physical System Designs</i>, Jason Jaskolka, CU</li> <li>• <i>Cyber Senses: Modeling Network Situational Awareness after Biology</i>, Benjamin Blakely, ANL</li> </ul>	
5:00 – 5:15 ET	Break		
5:15-6:15 ET	SESSION 4		
<p><b>TRACK 1: Supply Chain Security for Industrial Control Systems</b></p> <p><u>Chair</u>                  Quanyan Zhu, NYU</p> <p><u>Presenters</u>                  Jennifer Pederson, CISA                  Charmaine Sample, MTSI                  Sachin Schetty, Old Dominion University                  Junaid Farooq, University of Michigan</p>	<p><b>TRACK 2: Resilient Communications</b></p> <p><u>Chair</u>                  Brad Nelson, INL</p>	<p><b>TRACK 3: "Homeland" Critical Infrastructure Resiliency Tabletop Exercise</b></p> <p><u>Chair</u>                  Kendall Bean, Univ of Idaho</p> <p><u>Presenters</u>                  Chandler Bean, BYU-I                  Michael Haney, U of Idaho                  David Oliver, INL</p>	



## THURSDAY, OCTOBER 21 (Hot Topic Day)

10:45-11:00 ET	Welcome – Ethan Huffman		
11:00 – 12:30 ET	<b>Plenary Panel – Policies and Priorities to Advance Cyber Resilience in Critical Facilities and Infrastructures</b>  <u>Panelists</u> Sudha Vyas, DOD CIO Chief Architect Puesh Kumar, DOE CESER Acting Principal Deputy Assistant Secretary David Mussington, Executive AD Infrastructure Security Division (ISD) within CISA  <u>Moderator</u> Zach Tudor, INL N&HS Associate Laboratory Director		
12:30-12:45 ET	Break		
12:45 – 2:15 ET	<b>SESSION 1</b>		
	<b>TRACK 1: <i>Is Mission Decomposition the Key to Unlocking Energy Resilience?</i></b>  <u>Chair/Presenter</u> Jonathon Monken, Converge Strategies	<b>TRACK 2: <i>Artificial intelligence and Machine Learning</i></b>  <u>Chair</u> Char Sample, MTSI  <u>Presenters</u> Char Sample, MTSI James LaRue,	<b>TRACK 3: <i>Applying Advanced Grid Technologies for Improving Resiliency of Critical Loads</i></b>  <u>Chair</u> Charlie Vartanian, PNNL  <u>Presenters</u> Clay Koplin, Cordova Electric Cooperative Dan Borneo and Waylon Clark, Sandia Lauren Khair, NRECA Frank Tuffner and Jeremy Twitchell, PNNL
2:15 – 2:45 ET	Lunch Break		
2:45-3:45 ET	<b>SESSION 2</b>		
	<b>TRACK 1: <i>Climate Informed Infrastructure Resilience Engineering</i></b>  <u>Chairs/Presenters</u> Andy Bochman, INL Gavin Hawkey, INL Ryan Cobey, INL	<b>TRACK 2: <i>Challenges in human-machine teaming with AI</i></b>  <u>Chairs</u> Katya LeBlanc, INL; Nate Evans, ANL; Stephanie Pilkington, UNCC	<b>TRACK 3: <i>Commercial Routing Assistance (CRA) capability with the CISA Integrated Operations Division (IOD) and All Hazards Consortium (AHC)</i></b>  <u>Chair</u> Tim Klett, INL  <u>Presenter</u> Greg M., CISA IOD
3:45 – 4:00 ET	Break		
4:00 – 5:00 ET	<b>SESSION 3</b>		
	<b>TRACK 1: <i>Water and the Built Environment</i></b>  <u>Chair</u> Irene Susini, Frontiers Media	<b>TRACK 2: <i>Structured Threat Intelligence Graph Case Studies and Use</i></b>  <u>Chair</u> Nate Evans, ANL	<b>TRACK 3: <i>Electric Vehicle and Grid Integration: Tools for a Resilient Electrified Transportation Future</i></b>  <u>Chair</u> Tim Pennington, INL
5:00 – 5:15 ET	Break		
5:15 – 6:15 ET	<b>SESSION 4</b>		

# Resilience Week 2021

<p><b>TRACK 1:</b> <i>American Water Works Association and West Yost: How Consequence-driven Cyber-informed Engineering (CCE) helped us to be more Resilient</i></p> <p><u>Chair</u> Tim Klett, INL</p> <p><u>Presenter</u> Andy Ohrt – West Yost</p>	<p><b>TRACK 2:</b> <i>Digital Twins a New Frontier in Critical Infrastructure Protection</i></p> <p><u>Chair</u> Nii Attoh-Okine, UD</p> <p><u>Presenters</u> John Sobanjo, Florida State University Hubo Cai, Purdue University Nii Attoh-Okine, Univ of Delaware</p>	<p><b>TRACK 3:</b> <i>Learning Large-Scale Real-World Data for Characterizing and Improving Energy System Resilience</i></p> <p><u>Chair</u> Feng Qiu, ANL</p> <p><u>Presenters</u> Alinson Xavier, ANL Feng Qiu, ANL Rui Yao, ANL</p>
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