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Webinar Agenda
Advanced Sensors and Instrumentation (ASI)
2020 NE I&C Review
(All Times are Eastern Daylight Time)

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Thursday, October 29, 2020

10:00 am   Welcome and Overview of Webinar Protocol (Pattrick Calderoni, INL)

10:10 am   ASI Program Overview (Suibel Schuppner, DOE)

10:30 am   ASI Research Overview (Pattrick Calderoni, INL)

10:50 am   ASI Technology Qualification Process (Yogi Dayal, INL)

11:20 am   Nuclear Energy Sensor database (Tim Downing, PNNL)

11:50 am   Q&A Session

12:00 pm   **Break**

Sensors and Instrumentation:

12:15 pm   3-D Chemo-Mechanical Degradation State Monitoring, Diagnostic and Prognostics of Corrosion Processes   in Nuclear Power Plant Secondary Piping Structures (PI - Douglas Adams, Vanderbilt University)

12:45 pm   High temperature embedded/integrated sensors (HiTEIS) for remote monitoring of reactor and fuel cycle systems (PI - Xiaoning Jiang, North Carolina State University)

1:15 pm   **Lunch**

2:00 pm   Versatile Acoustic and Optical Sensing Platforms for Passive Structural Monitoring (PI – Gary Pickrell, Virginia Tech University)

2:30 pm   Integrated silicon/chalcogenide glass hybrid plasmonic sensor for monitoring of temperature in nuclear facilities (PI - Maria Mitkova, Boise State University)

3:00 pm   Development of Optical Fiber Based Thermometer and its Demonstration in a University Research Reactor Using Statistical Data Analytic Methods to Infer Power Distribution from Gamma Thermometer Response – (PI - Tom Blue, Ohio State University)

3:30 pm   Acousto-optic Smart Multimodal Sensors for Advanced Reactor Monitoring and Control (PI - Michael Larche, PNNL)

4:00 pm   A Self-Powered, Wireless Sensor System for Remote and Long-Term Monitoring of Internal Conditions of Spent Nuclear Fuel Dry-Storage Casks – SBIR – (PI-Dan Xiang, X-waveinnovations)

4:30 pm   High Fluence Active Irradiation and Combined Effects Testing of Sapphire Optical Fiber Distributed Temperature Sensors   (PI - Joshua Daw/Kelly McCary, INL)

5:00 pm   Feedback/Discussion (Pattrick Calderoni, INL)

5:15 pm   *Adjourn*

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Thursday, November 5, 2020

10:00 am   Welcome and Overview of Webinar Protocol (Pattrick Calderoni, INL)

Sensors and Instrumentation:

10:15 am   Irradiation behavior of piezoelectric materials for nuclear reactor sensors - (PI - Marat Khafizov, Ohio State University)

10:45 am   Real time in-core instrumentation: from fuels and materials irradiation tests to advanced reactor demonstration – (PI - Troy Unruh, INL)

11:15 am   Rad-hard electronics for data communication and advanced controls – (PI – Kyle Reed, ORNL)

11:45 am   **Break**

12:00 pm   Performance demonstration in operational conditions – (PI - Joe Palmer, INL)

12:30 pm   Develop and maintain capabilities to support I&C technology deployment – (PI - Malwina Wilding, INL)

12:45 pm   Wireless LVDTs - (PI - Heng Ban, University of Pittsburgh)

1:00 pm   Fiber Optics Sensor Enabled I&C and Artificial Intelligence Data Analytics for Nuclear Energy (PI - Kevin Chen, University of Pittsburgh)

1:15 pm   **Lunch**

Nuclear Plant Communication:

2:00 pm   Wireless Sensing and Communication Capabilities from In-Core to a Monitoring Center (PI- Vivek Agarwal, INL)

2:30 pm   Transmission of Information by Acoustic Communication along Metal Pathways in Nuclear Facilities (PI - Alexander Heifetz, ANL)

3:00 pm   Wireless Reactor Power Distribution Measurement System Utilizing an In-Core Radiation and Temperature Tolerant Wireless Transmitter and a Gamma-Harvesting Power Supply (PI - Jorge Carvajal, Westinghouse Electric Company)

3:30 pm   Self-Powered Wireless Through-Wall Data Communication for Nuclear Environments (PI - Lei Zuo, Virginia Tech)

4:00 pm   Irradiation of Optical Components of In-Situ Laser Spectroscopic Sensors for Advanced Nuclear Reactor Systems (PI – Igor Jovanovic, University of Michigan)

4:30 pm   Feedback/Discussion (Pattrick Calderoni, INL)

5:00 pm   *Adjourn*

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Thursday, November 12, 2020

10:00 am　　　Welcome and Overview of Webinar Protocol (Pattrick Calderoni, INL)

Sensor and Instrumentation

10:15 am　　　Sensor advanced manufacturing and structural materials characterization – (PI - Mike McMurtrey, INL)

10:45 am　　　In-core measurement systems for nuclear materials characterization and codes V&V - (PI - Zilong Hua, INL)

11:15 am　　　Direct Digital Printing Sensors for Nuclear Energy Applications (PI - Tim McIntyre, ORNL)

11:45 am　　　Material science and advanced manufacturing of sensors (PI - Brian Jaques, Boise State University)

12:15 pm　　　Break

Big Data, Machine Learning, Artificial Intelligence

12:30 pm　　　Analytics at scale of Sensor Data for Digital Monitoring in Nuclear Plants (PI - Vivek Agarwal, INL)

1:00 pm　　　Process Constrained Data Analytics for Sensor Assignment and Calibration (PI - Rick Vilim, ANL)

1:30 pm　　　Lunch

2:15 pm　　　Cost-Benefit Analysis through Integrated Online Monitoring and Diagnostics (PI – Dave Grabaskas, ANL)

2:45 pm　　　Design of Risk-informed Autonomous Operation for Advanced Reactors (PI – M. Golay, MIT)

3:15 pm　　　Context-Aware Safety Information Display for Nuclear Field Workers (PI – Pingbo Tang, Carengie Mellon, University)

3:45 pm　　　Advanced Online Monitoring and Diagnostic Technologies for Nuclear Plant Management, Operation, and Maintenance (PI – Daniel Cole, University of Pittsburgh)

4:15 pm　　　High-performance nanostructured thermoelectric materials and generators for in-pile power harvesting (PI- Yanliang Zhang, University of Notre Dame)

4:45 pm　　　Concluding Remarks (Suibel Schuppner, DOE)

5:30 pm　　　*Adjourn*