U.S. DEPARTMENT OF ENERGY | Nuclear Energy

Nuclear Energy Enabling Technologies (NEET)

Advanced Sensors and Instrumentation (ASI)

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Office of Nuclear Energy Webinar on ASI

October 12, 2016

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2016 NE Webinar on ASI

- **Purpose: Review the on-going I&C research across NE through presentations and discussion**
  - Inform participants on planned and ongoing NE I&C research
  - Obtain progress updates of on-going projects
  - Learn results and insights from concluding projects

- **Outcome: Better understanding of I&C research across NE**
  - Feedback from R&D Programs on current and planned research
  - Coordination of research activities
  - Identify future needs and opportunities

- **Materials: Summary of the meeting with presentations**
  - Posted on the NE website www.energy.gov/ne

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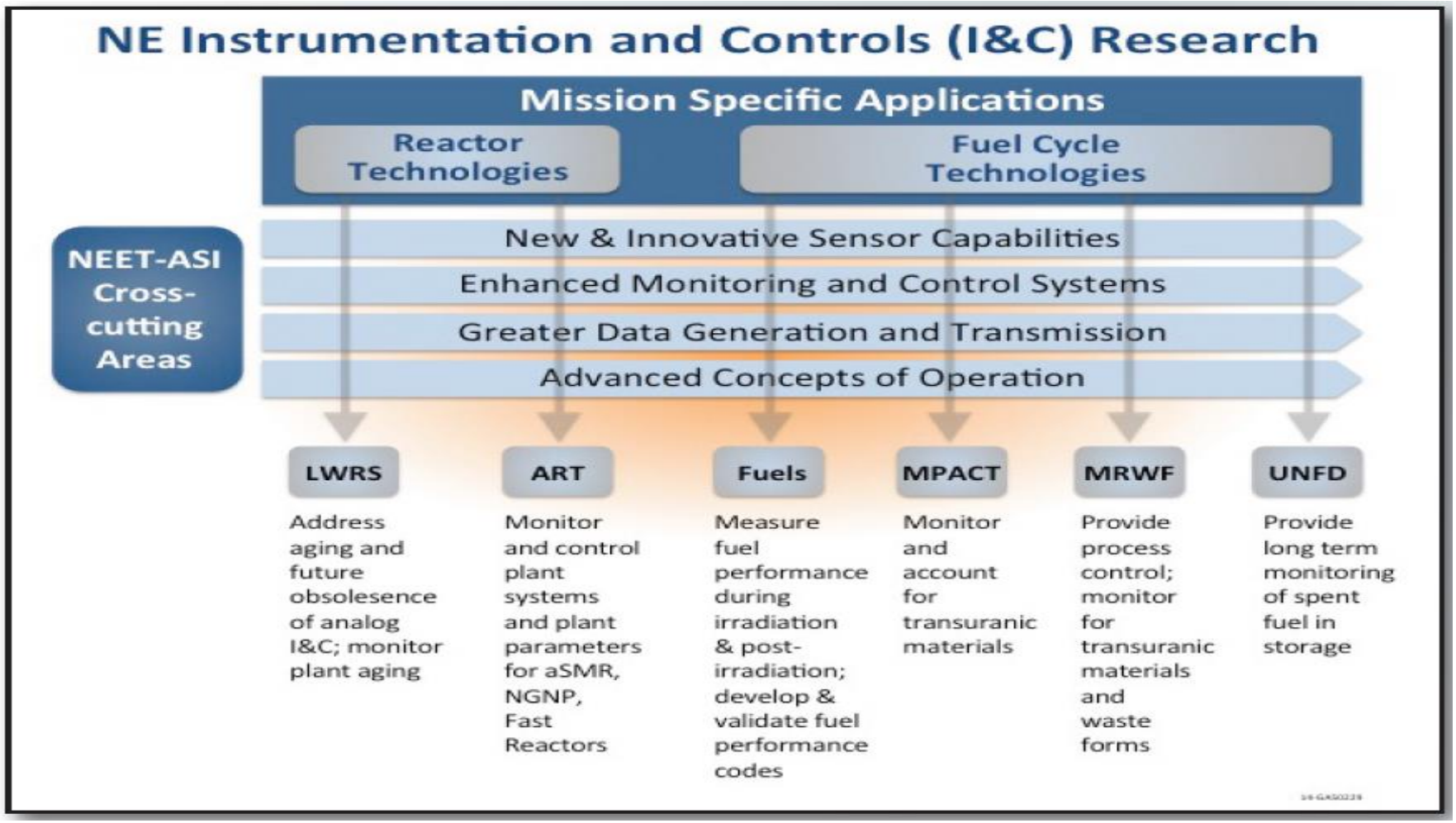
I&C Research Across NE



[LWRS-Light Water Reactor Sustainability; ART-Advanced Reactor Technologies; Fuels -Advanced Fuels; MPACT-Materials Protection, Accounting and Control Technology; MRWF- Material Recovery and Waste Form Development; UNFD-Used Nuclear Fuel Disposition]

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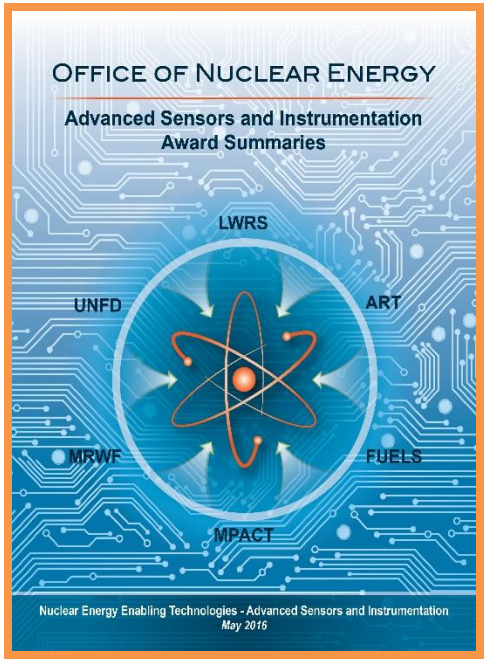
Nuclear Energy Enabling Technologies: Advanced Sensors and Instrumentation

Vision

Develop advanced sensors and instrumentation technologies that address critical technology gaps for monitoring and controlling advanced reactors and fuel cycle facilities

Goals

- **Support DOE-NE R&D programmatic needs and the Gateway for Accelerated Innovation in Nuclear (GAIN) Initiative**
  - Fuel & material studies, integral tests
- **Provide new capabilities for measurement and control**
  - Sensors for harsh environments, advanced control capabilities, fault tolerant operations
- **Address R&D needs for successful deployment**
  - Digital technology qualification, advanced operational concepts



www.energy.gov/ne

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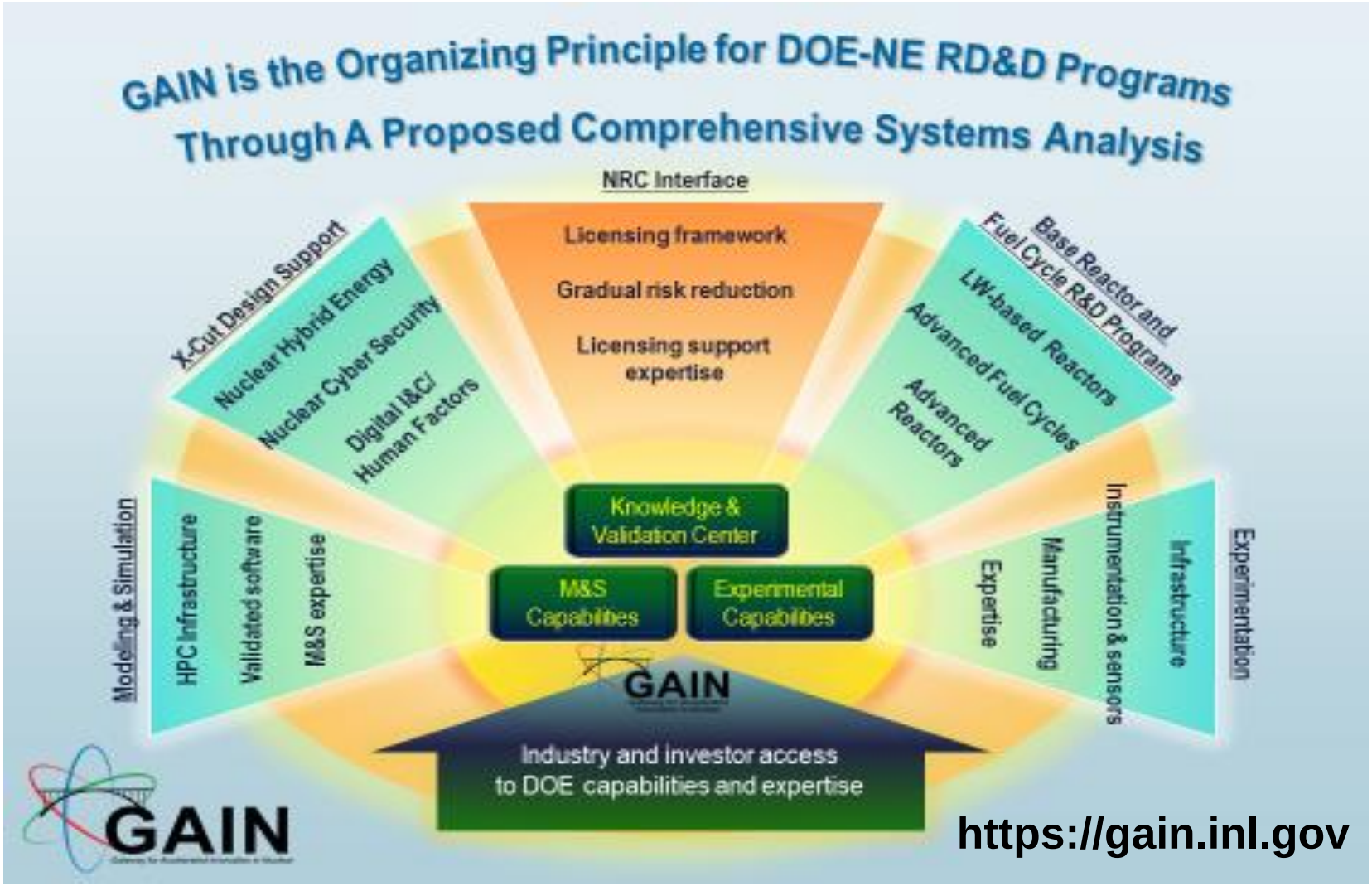
Gateway for Accelerated Innovation in Nuclear



https://gain.inl.gov

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NEET-ASI Current Awards

FY	Project Title	Principal Investigator
2014	Enhanced Micro-Pocket Fission Detector (MPFD) for High Temperature Reactors	Troy Unruh, Idaho National Laboratory
2014	Nanostructured Bulk Thermoelectric Generator for Efficient Power Harvesting for Self-powered Sensor Networks	Yanliang Zhang, Boise State University
2014	Robust Online Monitoring Technology for Recalibration Assessment of Transmitters and Instrumentation	Pradeep Ramuhalli, Pacific Northwest National Laboratory
2014	Operator Support Technologies for Fault Tolerance and Resilience	Richard Vilim, Argonne National Laboratory
2014	Embedded Instrumentation and Controls for Extreme Environments	Roger A. Kisner, Oak Ridge National Laboratory
2014	High Spatial Resolution Distributed Fiber-Optic Sensor Networks for Reactors and Fuel Cycle Systems	Kevin Chen, University of Pittsburgh
2015	Nuclear Qualification Demonstration of a Cost Effective Common Cause Failure Mitigation in Embedded Digital Devices	Matt Gibson, Electric Power Research Institute
2015	Development and Demonstration of a Model Based Assessment Process for Qualification of Embedded Digital Devices in Nuclear Power Applications	Richard Wood, University of Tennessee
2016	Transmission of Information by Acoustic Communication along Metal Pathways in Nuclear Facilities	Richard Vilim, Argonne National Laboratory
2016	Wireless Reactor Power Distribution Measurement System Utilizing an In-Core Radiation and Temperature Tolerant Wireless Transmitter and a Gamma-Harvesting Power Supply	Jorge Carvajal, Westinghouse Electric Company
2016	Self-powered Wireless Through-wall Data Communication for Nuclear Environments	Lei Zuo, Virginia Tech

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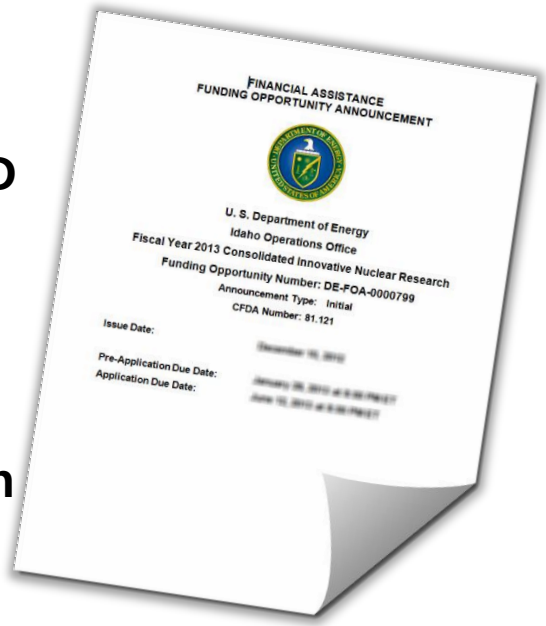
FY 2017 Consolidated Innovative Nuclear Research (CINR) Funding Opportunity Announcement (FOA)

- **University-led R&D [Nuclear Energy University Programs (NEUP)]**
  - Program and Mission Supporting
- **Industry-, University-, or National Laboratory-led R&D [Nuclear Energy Enabling Technologies (NEET) Program]**
  - Advanced Methods for Manufacturing
  - **Advanced Sensors and Instrumentation**
- **University-led, Program Directed Integrated Research Projects [NEUP]**
  - Program Directed work


FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U. S. Department of Energy
Idaho Operations Office
Fiscal Year 2013 Consolidated Innovative Nuclear Research
Funding Opportunity Number: DE-FOA-0000799
Announcement Type: Initial
CFDA Number: 81.121

Issue Date:
Pre-Application Due Date:
Application Due Date:

www.neup.gov

FOA dates

- **FOA release: August 10, 2016**
- **Pre-applications Due: September 14, 2016 (not needed for IRPs)**
- **Full R&D/NSUF/IRP Applications Due: February 15, 2017**

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Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STT) : Advanced Technologies for Nuclear Energy

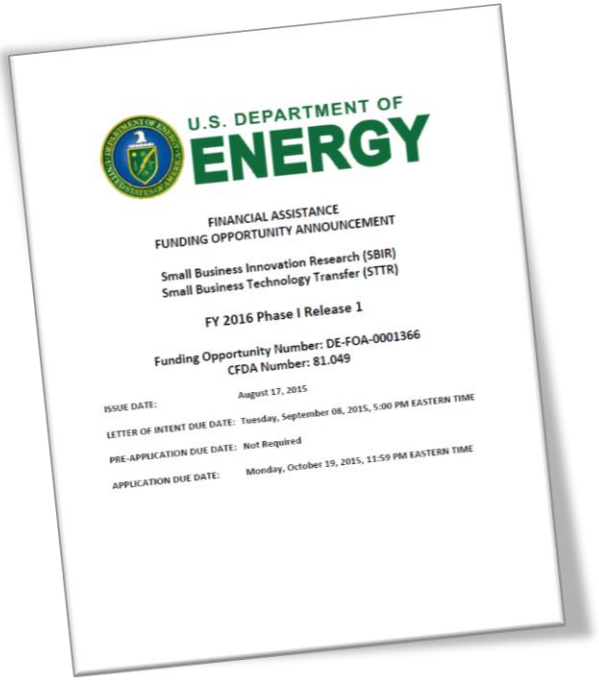
- Competitive awards for small businesses only
- Winners keep the rights to any technology developed and are encouraged to commercialize the technology
- Funded by federal R&D budgets set aside

NE funds SBIR and STTR projects

- Office of Nuclear Energy Section

Phase I Release 2

- Topics Issued: **October 31, 2016**
- Webinar: **Week of November 07, 2016**
- FOA Issued: **November 28, 2016**
- LOI Due: **December 19, 2016**
- Application Due: **February 07, 2017**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FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

Small Business Innovation Research (SBIR)
Small Business Technology Transfer (STTR)

FY 2016 Phase I Release 1

Funding Opportunity Number: DE-FOA-0001366
CFDA Number: 81.049

ISSUE DATE: August 17, 2015
LETTER OF INTENT DUE DATE: Tuesday, September 08, 2015, 5:00 PM EASTERN TIME
PRE-APPLICATION DUE DATE: Not Required
APPLICATION DUE DATE: Monday, October 19, 2015, 11:59 PM EASTERN TIME

www.science.energy.gov/sbir

Summary

- Improvements and advancements in **ASI technologies** will
  - enable advances in nuclear reactor and fuel cycle system development
  - enhance economic competitiveness for nuclear power plants, and
  - promote a high level of nuclear safety.
- NEET-ASI research produces **concepts, techniques, capabilities, and equipment** that are or can be demonstrated in simulated or laboratory test bed environments representative of nuclear plant systems or fuel cycle systems **in support of GAIN**.
- Innovative and crosscutting research is funded through **competitive**, peer-reviewed, **solicitations**.

I&C technologies are a vital key to enabling the expansion of clean, safe and economical nuclear power.

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ASI Contact Information

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