

FY 2024 **Super** RTE

March 25, 2024

U.S. DEPARTMENT OF
ENERGY

Office of
NUCLEAR ENERGY



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Rapid Turnaround Experiments (RTEs)

- **Mission**

- To facilitate the advancement of nuclear science and technology by providing researchers with access to world-class capabilities at no cost to the researcher
 - Irradiation testing
 - Post irradiation examination (PIE)
 - Idaho National Laboratory (INL) high performance computing (HPC)
 - Technical and scientific assistance for the design and execution of project

- **Research Areas of Interest**

- Directly support Office of Nuclear Energy (NE) research and development (R&D) programs
 - Light Water Reactor Sustainability Program, Fuel Cycle R&D, Advanced Modeling and Simulation, Next Generation Nuclear Program, and the Generation IV Nuclear Energy Systems Initiative (<https://www.energy.gov/ne/office-nuclear-energy>)
- Perform quick analysis of a small number of irradiated or radioactive materials or nuclear fuels research, including in situ sensor performance characterization
 - Neutron, charged particle, actinide, nuclear fuel

What are Super Rapid Turnaround Experiments (RTEs)?

- **Objective**

- Offer an avenue for researchers to perform irradiation effects studies of **broader** scope on nuclear fuels and materials utilizing NSUF

- Up to **two** partner institutions for PIE

- One partner institution for irradiation

- One partner institution for sample preparation/shipping

- **Double** the access time at NSUF facilities

- **Limitation**

- Super RTE call is expected **annually**

- **12-month** project duration

Super RTE Facility Access Guidelines (https://nsuf.inl.gov/Page/super_rte)

Up to 6 Weeks

- Center for Advanced Energy Studies - Microscopy and Characterization Suite
- Oak Ridge National Laboratory - Low Activation Materials Development and Analysis Facility
- University of Florida - Materials Characterization Facility

Up to 4 Weeks

- Argonne National Laboratory - Intermediate Voltage Electron Microscopy - Tandem Facility
- Idaho National Laboratory - Analytical Laboratory, Electron Microscopy Laboratory, Irradiated Materials Characterization Laboratory
- Los Alamos National Laboratory - Lujan Center Beamlines, Plutonium Surface Science Laboratory
- Massachusetts Institute of Technology - MIT Nuclear Reactor Laboratory
- North Carolina State University - Nuclear Reactor Program
- Pacific Northwest National Laboratory - Radiochemistry Processing Laboratory, Materials Science and Technology Laboratory (PIE only)
- Purdue University - Interaction of Materials with Particles and Components Testing Facility
- Sandia National Laboratory - Ion Beam Laboratory, Gamma Irradiation Facility
- Texas A&M University – Accelerator Laboratory
- The Ohio State University - Nuclear Reactor Laboratory
- University of California, Berkeley - Nuclear Materials Laboratory
- University of Michigan - Michigan Ion Beam Laboratory
- University of Wisconsin - Characterization Laboratory for Irradiated Materials, Wisconsin Tandem Accelerator Ion Beam
- Westinghouse - Churchill Laboratory Services

Up to 2 Week

- Idaho National Laboratory - Hot Fuel Examination Facility
- Lawrence Livermore National Laboratory – Center for Accelerator Mass Spectroscopy
- Oak Ridge National Laboratory - Irradiated Fuels Examination Laboratory, Irradiated Materials Examination and Testing Facility

Up to 6 Days

- Brookhaven National Laboratory - NSLS II X-ray Powder Diffraction (XPD) Beamline

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Facility Guidelines for Super RTE Experiments

- Guidelines are designed to help researchers develop a proposal that can be executed within the Super RTE schedule and budget.
 - Irradiation *and* PIE should assume approximately *two* weeks of access time at the irradiation facility and *two* weeks at the PIE facility
 - Neutron irradiation experiments that require the use of ATR, TREAT, HFIR or MITR in core positions do not qualify
- PIs should work with each facility representative, *prior to proposal submission*, to ensure proposed work (scope, number of specimens, cost, etc.) can be accomplished within the Super RTE guidelines for that facility, and the project scope can be completed within 12 months from award.

Rules for Super RTE Proposal Submission

- **Content**

- Must be original, no duplication of other funded work
- **Scope must be unique, with no overlap with existing or proposed scope**
- Produced data will lead to a scientific or engineering outcome that are suitable for publication and will be attributed to the NSUF
- Must focus on irradiated or radioactive materials or nuclear fuels research, including in situ sensor performance characterization
 - Proposals can include limited non-irradiated structural or cladding reference samples, as appropriate

- **Facility**

- Use NSUF capabilities at **up to four partner institutions**
 - One partner institution for sample preparation/shipping; One for irradiation; **Two** for PIE
 - Requesting *only* sample preparation and/or sample shipment is not allowed
 - Proposals that request both irradiation and PIE should remain within the suggested RTE guidelines

- **Funding**

- Only supports activities at, and shipping between, NSUF facilities
- No funding to the PI to support salaries, tuition, travel, or other costs typically supported via NE Program R&D funds
- Awarded Super RTEs must be completed no more than **12** months from the date of award

Rules for Super RTE Proposal Submission (continued)

- **Project Completion**

- Must be completed within **12** months of award
- **Only two RTEs and one Super RTE project can be active at any given time**
- A completion report for one of the active projects must be submitted at least 2 weeks before the call closes to be eligible to submit an RTE or Super RTE proposal
- NSUF recommends using a data management plan by utilizing the Nuclear Research Data System (NRDS)
 - NRDS is a newly developed NSUF HPC data repository
 - NRDS will provide lifecycle storage of NSUF and NEUP project data

- **Completion Report Criteria**

- Report should provide a summary of both the work completed and the data obtained
- Describe the potential impact to the state-of-knowledge
- **Completion reports must be submitted within 4 months of any completed RTE project**
- A project is considered active until a completion report is submitted and approved

Rules for Super RTE Proposal Submission (continued)

- **PI Expectations:**

- Only one PI per proposal
- A PI may submit no more than one proposal per Super RTE call
- **To be eligible for a Super RTE proposal submission:**
 - *A PI may have up to two awarded traditional RTE projects, with none under review, or*
 - *A PI may have up to one awarded traditional RTE project, with one under review*
- Proposals from PIs not from a U.S. institution must include a collaborator who is from the U.S. and this collaborator must have a significant role in the experiment or project that supports the RTE
 - The roles and responsibilities for each U.S. collaborator must be clearly identified in the technical narrative
- All proposals must include a **3-page** technical narrative, curriculum vitae (or equivalent) for the PI and all team members
- Proposals must include all publications the PI and co-PIs have produced as a result of any and all previous NSUF funded experiments or projects (RTE and CINR)
- Data generated from the work must be made available to the research community in a timely manner. The PI is responsible for the collection, management, and sharing of the research data through a data management plan (e.g., NRDS)
- Acknowledgment of NSUF-funded research

Failure to meet any of the above rules will result in disqualification of the proposal

Acknowledging the NSUF

- NSUF projects: This work was supported by the U.S. Department of Energy, Office of Nuclear Energy under DOE Idaho Operations Office Contract DE-AC07- 05ID14517 as part of Nuclear Science User Facilities award #_____.
- HPC work: This research made use of Idaho National Laboratory's High Performance Computing systems located at the Collaborative Computing Center and supported by the Office of Nuclear Energy of the U.S. Department of Energy and the Nuclear Science User Facilities under Contract No. DE-AC07-05ID14517.

Review Process

- **Program Relevance**

- Support, advance, demonstrate recognizable ties to the NE mission and relevant topics
- Build on synergies with ongoing direct- or competitively-funded projects or meet a critical mission need

- **Feasibility**

- Ensure proposed work (scope, number of specimens, etc.) can be accomplished within the Super RTE guidelines for that facility, and the projects can be completed within 12 months from award

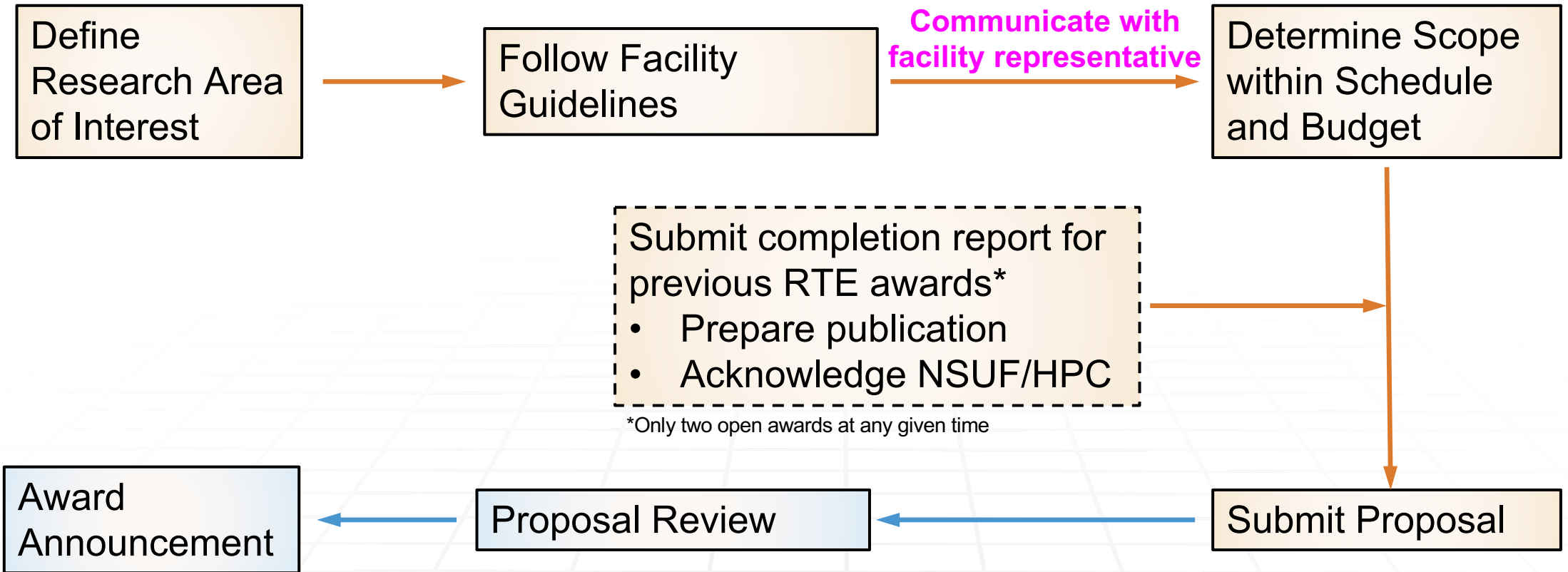
- **Technical/Scientific merit**

- Scientific merit (50%)
- Technical feasibility (30%)
- Capability of the team (20%)

- **Panel review**

- Reviews technical comments and scores to ensure consistency across the reviews
- Provides a ranked list to the NSUF Director
- The NSUF Director makes the final award recommendation to NE
 - Balance the distribution of funds in a single call to impact a broad group of researchers
 - Decline proposals with very large budgets out of proportion to the guidelines
 - Restrict awards to applicants who have a poor record of completing awarded RTEs within the specified period and/or have a poor record of timely publication and/or acknowledgment of NSUF-funded research
 - Grant 5 additional points to proposals with a PI from a minority serving institution (MSI)

Summary of RTE Proposal Preparation and Review



Tips for Success

- Plan ahead
- Work with facility representative *before* submitting proposal
- Ensure sample readiness
- Request samples from the NSUF Nuclear Fuels and Materials Library when possible
- Read Super RTE Rules for Proposal Submission (https://nsuf.inl.gov/Page/super_rte)
- Seek feedback

Super RTE Call Schedule

Call announcement seminar	3/25/2024 11 a.m. - 12 p.m. MDT
Solicitation period opens	4/1/2024
Individual Q&A sessions <i>(must be scheduled in advance by contacting the RTE Administrator: anna.podgorney@inl.gov)</i>	4/24/2024 9 a.m. – 4 p.m. MDT
Proposal due date	4/30/2024 at 4 p.m. MDT
Selection review	Estimated 6/1/2024
Proposals awarded	Estimated 8/1/2024

RTE Program Administration

- Brenden Heidrich, *Director*
- Collin Knight, *Deputy Director*
- Keith Jewell, *Chief Scientist*
- Rongjie Song, *Chief Scientist*
- Anna Podgorney, *RTE Administrator* (anna.podgorney@inl.gov, (208) 526-2123)



Please contact Anna to schedule Individual Q&A session in April!

