

REQUEST FOR PROPOSAL

The National Strategic Research Institute (NSRI) at the University of Nebraska is pleased to announce its inaugural Independent Research and Development (IRAD) FY2021 Request for Proposal (RFP).

The purpose of the NSRI IRAD program is to develop strategic technical capabilities & competencies and enable science, technology and engineering in support of our Sponsor United States Strategic Command (USSTRATCOM), as well as our broader Mission for Combating Weapons of Mass Destruction. The NSRI IRAD program will: 1) enable and support our core research areas, now and in the future; 2) lead innovation efforts that support the NSRI mission and proactively serve our customers; and 3) cultivate national security-focused research within the University of Nebraska academic community.

PROPOSAL SCOPE

This call is open to University of Nebraska constituents only. The IRAD focuses on science, technology and engineering investments that will develop skills, capabilities and systems relevant for future customer engagement opportunities. This initial call will consider both Strategic Investment proposals, those that are considered “high-risk” R&D in support of capability and program development, as well as Tactical Investment proposals that will “bridge the gap” between existing research and customer needs.

NSRI IRAD INVESTMENTS MUST FALL UNDER ONE THE FOLLOWING FOCUS AREAS:

Nuclear Weapons Enterprise Support

This area will include projects supporting research and exercises for the nation’s most challenging issues surrounding the world’s most destructive weapons. These include: strengthening U.S. nuclear deterrence, advancing thought regarding U.S. nuclear weapons and mitigating the effects of foreign nuclear weapons.

Technologies for Detecting & Countering Biological, Chemical & Radiological Weapons

This area will include projects that support new technologies for interdiction, detection and mitigation of the direct effects of WMDs and their health impacts; including unique research that directly supports and transitions to operational elements and end users.

Medical Countermeasures & Response

This area will include projects that support the development of medical countermeasures from discovery and design to manufacturing, bio-containment and clinical treatments as well as vaccine design, novel preventive and prophylactic treatment, drug delivery, clinical protocols, and training for a variety of pathogens, including select agents.

HIGH PRIORITY AREAS OF INTEREST

It is up to the proposer to clearly demonstrate how their proposal aligns with the focus areas. Additionally, this year the NSRI IRAD program encourages/requests that all proposals fall within the following high priority areas.

Chemical Sciences

The elimination of stockpiles of chemical warfare agents (CWAs) is a slow, expensive process that typically utilizes chemical neutralization and/or incineration of the CWA. Chemical neutralization uses a gross excess (greater than 10x molar ratio) of neutralization material to CWA. During this process, large quantities of highly hazardous waste are produced.

NSRI seeks proposals to develop catalytic methods that have the potential to safely and rapidly eliminate stockpiles of chemical warfare agents such as sulfur mustard, sarin, and/or VX.

Nuclear Matters

Both of the two great power competitors to the United States, Russia and China, have intimated in their most recent political and doctrinal writings that their escalation philosophy would entail an extremely rapid, intense burst of military power in order to achieve and consolidate gains before the United States is able to effectively respond with potentially overwhelming military might ... the so-called *fait accompli*. However, the United States has adequately studied neither the escalation philosophies of these great power competitors nor the mathematical modeling and visualization of multi-modal escalation dynamics.

NSRI seeks proposals aimed at research and exploration into escalation visualization methods for rapid and accurate understanding at the decision maker level. While escalation metrics and historical pathways also need to be researched, escalation visualization research can begin with draft metrics and proxy metrics prior to initiation of escalation metrics research. Given the complexity and span of 21st century multi-modal escalation, ranging from low-intensity non-kinetic actions all the way through high-intensity nuclear employment, we feel that an appropriate visualization tool will be essential for decision support. The first step toward such a visualization tool is exploration of competing escalation visualization approaches and methodologies.

Strategic Mission Systems

To understand how close the U.S. is to "strategic deterrence failure," a new framework needs to be developed to bring together diverse data streams (hard and soft data, along with context-based sentiment) to help make assessments about our how well the U.S. deterrence strategy is working.

NSRI seeks proposals to develop analytic products to track "metrics" or "trends," in the aforementioned diverse data streams, to explore algorithms to determine how close the U.S. is to strategic deterrence failure (5 weeks, 5 months, or 5 years), and to construct analytic frameworks to answer senior leader questions, and novel approaches to present information to senior leaders.

Training

NSRI seeks proposals to identify and address critical gaps in national capability to address public health and medical needs during pandemics and WMD events. A successful proposal would demonstrate a plan to develop an adaptable, regional, and programmatic approach to align core competencies and SOP's across applicable units. Initially the project will focus on these four priorities: 1) medical screening and care in emergencies 2) points of dispensing, mass vaccination, and other mass dispensing efforts 3) use of units outside of local jurisdiction 4) training community members to respond in collaboration with state and federal governments. The project will propose a sustainable deployment and response training program by leveraging relationships and the extensive expertise in emergency operations, planning, execution, and training. Remote survey workshops would bring together agencies to address gaps and issues in order to identify the core competencies for training and alignment.

Biological Sciences Area

The current COVID-19 pandemic has demonstrated that natural mutations or engineered mutations to a virus can enhance pathogenicity. However, genetic alterations of biological organisms can also provide benefits.

NSRI seeks proposals to examine the use of synthetic biology to combat WMD through the development of modified organisms that could be used to protect warfighters from exposure to threats or to destroy threat agents (chemical, biological radiological).

NSRI also seeks proposals to examine the ability to understand and predict the impact of mutations on viral phenotypes.

Additional areas of Interest

In addition to the specific areas identified above, NSRI will review proposals covering a broad range of topics that address various areas of need across the Countering Weapons of Mass Destruction community. Other example areas are:

- Self-decontaminating materials for any or all hazards
- Waterless decontamination for chemical and biological agents
- Biosurveillance
- Novel Chemical and Biological Detection Approaches
- Fieldable Point of Care Diagnostics
- Nuclear Command and Control

The following are not within the scope of this call and proposals will not be submitted for review.

- Augmentation of already funded programs or projects
- Projects that have consistently failed peer review
- Construction of facilities or general equipment purchases

ELIGIBILITY, FUNDING AMOUNTS AND PROJECT DURATION

The NSRI IRAD call is only open to University of Nebraska faculty, staff and students. Anticipated awards will be between \$15k-\$25K.

Please note:

- New Projects cannot start charging until July 1, 2021.
 - Any purchase over \$5k must be approved by the IRAD Director.
 - Computer and lab equipment must be purchased prior to May 1, 2022.
 - Travel must be completed, vouchered, and approved by June 30, 2022.
 - Should be 99-100% costed at year end.
 - Funds must be spent by FYE.
 - No carryover is allowed.
- Total procurements (including subcontracts) may not exceed 30% of the project's FY target without prior approval from the NSRI IRAD Office.
- Proposed efforts may be for a single year, and should be able to demonstrate the potential for follow-on funding after the first year. Proposals selected in FY21 will be funded for FY21 **only**. Continuation proposals may be entertained based on programmatic interest and technical progress.

Submissions to the NSRI FY21 IRAD RFP should contain milestones and budget requests for FY21 only. Decisions regarding awards will be based on availability of funds. All funding must be obligated by June 30, 2022.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

The NSRI IRAD Proposal Process is a two-phase process:

Phase I: Abstract Submission

Phase Ia: Review

Phase Ib: Semi-Finalists Selected

Phase II: Proposal Submission

Phase IIa: Review

Phase IIb: Awards Made

Phase I

Technical Abstract Submission All FY21 IRAD proposers must submit their Phase I Abstract at nsri.nebraska.edu/IRAD by 11:59 p.m. (CST) on January 15, 2021. This includes:

Biographical Sketch:

- Name
- Title
- Education & Training (500 words)
- Research & Professional Experience (500 words)
- Publications (500 words)

Abstract:

- Proposal Title
- PI Name, Phone, Email, Title, Organization
- Abstract BLUF (bottom line up front) (250 words)
- Technical Approach (Method) (500 words)
- Alignment to the IRAD Project Call and/or NSRI Capabilities (500 words)
- Gross Budget Request

Phase II

All invited FY21 IRAD finalists must submit their Phase II Proposal by 11:59 p.m. (CST) on March 15, 2021. Materials will be provided to you on February 15, 2021. These will include:

1. Proposal (3-pages)
2. Budget breakdown (1-page)
3. Reference list (optional; 1-page)
4. Abstract (100 words)

Templates for the proposal, budget breakdown and abstract are included in the package found at nsri.nebraska.edu/IRAD. All submitted documents must adhere to the instructions provided.

NOTE: Proposers have the responsibility to clearly explain critical details needed for a reviewer to properly assess the proposal. Proposers should not assume that reviewers are experts in the specific area, nor that the reviewers will look at any material other than what is provided in the proposal.

GENERAL SELECTION PROCESS

IRAD Phase I Abstracts will be evaluated according to the following criteria:

- Value to the NSRI Focus Areas <https://nsri.nebraska.edu/innovative-capabilities>
- Technical Merit
- Ability to complete the work in time period provided
- Abstracts will be reviewed by the appropriate NSRI director. Up to 10 finalists will be selected to move on to the Technical Merit round.

IRAD Phase II Proposals will undergo a Technical Merit review where project proposers will present to a technical review committee comprised of subject matter experts. In addition to the written proposal, a presentation (virtual or in person) may be requested.

The NSRI IRAD Focus Area Directors and Technical Review Committee(s) will evaluate all submitted abstracts and proposals that meet the above criteria. The FADs and TRCs will make the final recommendations.

SCHEDULE

November 16, 2020	Request for Proposal made available at nsri.nebraska.edu/IRAD
November 16, 2020 – January 14, 2021	Open question period
January 15, 2021	Phase I proposal due
February 15, 2021	Finalist(s) notified
March 15, 2021	Phase II proposal due
June 2021	Announcement of NSRI IRAD recipients
July 1, 2021	Funds distributed
July 1, 2021 (Anticipated)	Start of award
13 months after start date	Final report due

Report templates will be provided to all awardees.

Please note that late submissions will not be accepted nor reviewed.

QUESTIONS

Submit through the Q&A form at nsri.nebraska.edu/IRAD.