



**Request for Applications (RFA) for
Innovations in Nuclear Energy Research & Development
Student Competition**

Subject: Innovations in Nuclear Energy Research & Development – RFA

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Contents

| | | |
|-----|---|----|
| 1 | Introduction | 3 |
| 2 | Eligibility Information..... | 4 |
| 3 | Award Description..... | 6 |
| 3.1 | Open Competition Award of Excellence (Undergraduate and Graduate Students)..... | 6 |
| 3.2 | Competition for Graduate Students Attending Minority Serving Institutions or Belonging to a Disadvantaged Community..... | 7 |
| 3.3 | Open Competition Special Recognition | 7 |
| 3.4 | Competition for Undergraduate Students Attending Minority Serving Institutions or Belonging to a Disadvantaged Community..... | 7 |
| 3.5 | Undergraduate Competition..... | 7 |
| 3.6 | Travel and Conference Opportunities..... | 8 |
| 4 | Application Submittal Requirements..... | 8 |
| 4.1 | Application Due Date | 8 |
| 4.2 | Application Schedule..... | 8 |
| 4.3 | Late Applications..... | 8 |
| 4.4 | Application Preparation Instructions | 8 |
| 5 | Application Instructions | 9 |
| 5.1 | Interpretations and Exceptions | 9 |
| 5.2 | Rights Reserved by NE..... | 9 |
| 5.3 | Application Validity Period..... | 9 |
| 5.4 | Discrepancies in the RFA | 9 |
| 6 | Deliverables and Obligations..... | 9 |
| 7 | Application Review and Selection Process | 10 |
| 7.1 | Evaluation Criteria..... | 10 |
| 8 | Award Administration Information..... | 10 |
| 8.1 | Notification of Award..... | 10 |
| 8.2 | Award Conditions..... | 10 |
| | Appendix A: Rules for Award Winners..... | 11 |

1 INTRODUCTION

This Request for Applications (RFA) is for the Innovations in Nuclear Energy Research and Development (R&D) Student Competition—referenced from this point forward as the Innovations Student Competition—as administered by the Department of Energy (DOE) Office of Nuclear Energy (NE). The purpose of the program is to recognize and award published graduate and undergraduate students for innovative nuclear energy research. Published works include those published through journal publications and conference proceedings. Questions regarding this RFA should be submitted to neup@inl.gov.

This competition is a continuation of the “Innovations in Nuclear Technology R&D Awards Program” that was supported from 2010 to 2022 by the Office of Nuclear Fuel Cycle and Supply Chain within the Department of Energy, Office of Nuclear Energy and administered by the University Research Alliance. For purposes of eligibility, the “Innovations in Nuclear Technology R&D Awards Program” and the “Nuclear Energy Research and Development (R&D) Student Competition” are the same.

The Office of Nuclear Energy (NE) mission is to advance nuclear energy science and technology to meet U.S. energy, environmental, and economic needs. NE has identified the following goals to address challenges in the nuclear energy sector, help realize the potential of advanced technology, and leverage the unique role of the government in spurring innovation:

- Keep existing U.S. nuclear reactors operating
- Deploy new nuclear reactors
- Secure and sustain our nuclear fuel cycle
- Expand international nuclear energy cooperation

Collectively, all NE-sponsored activities support the Department’s priorities to combat the climate crisis, create clean energy jobs with the free and fair chance to join a union and bargain collectively, and promote equity and environmental justice by delivering innovative clean energy technologies for nuclear energy systems.

All applications submitted under this RFA must demonstrate a strong tie to this mission. Applications focused specifically in areas not of interest to the NE mission, such as fusion energy, medical physics, nuclear forensics, or environmental management, will not be reviewed or considered.

The Innovations Student Competition is designed to:

- Award graduate and undergraduate students for innovative nuclear energy research as demonstrated through journal publications and conference presentations.
- Demonstrate the commitment of the Office of Nuclear Energy to higher education in nuclear disciplines relevant to the NE mission.
- Support communication among students and U.S. Department of Energy representatives.

Under this RFA, NE is seeking applications under five competitions, described in detail in Section 3:

1. Open Competition Award of Excellence (undergraduate and graduate students)
2. Competition for Graduate Students Attending Minority Serving Institutions or Belonging to a Disadvantaged Community
3. Open Competition Special Recognition
4. Competition for Undergraduate Students Attending Minority Serving Institutions or Belonging to a Disadvantaged Community
5. Undergraduate Competition

Applicants may be eligible for multiple categories and may compete in all of them; however, applicants are only eligible to win one award per year.

All information and instructions required to respond to this RFA are accessible at neup.gov. **Applications are due by November 29, 2023, at 5:00 pm ET.** Students must apply electronically at neup.gov. No hard copy applications will be accepted. NE anticipates making award announcements in Spring 2024.

2 ELIGIBILITY INFORMATION

It is critical to our nation's economic leadership and global competitiveness that the U.S. educate, train, and retain scientists and engineers from varying backgrounds. Applications will be accepted from all U.S. citizens and legal permanent residents pursuing nuclear science and engineering disciplines, including relevant social sciences.

To support the goal of building a clean and equitable energy economy, NE strives to contribute to the President's goal that 40% of the overall benefits of certain Federal investments flow to Disadvantaged Communities (DAC) (the Justice40 Initiative)¹. The goal is to spur economic development and job creation in DACs throughout the U.S., through effective teams and/or partnerships with institutions, located in a disadvantaged community that may receive funding support from the project.

In support of the Justice40 Initiative, the White House has developed the Climate and Economic Justice Screening Tool (CEJST) tool to identify DACs. CEJST can be found at <https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5>.

In addition, NE strives to ensure that it is fully committed to broadening the inclusion and contribution of those communities that have been historically underserved within its programs.

¹ The Justice40 initiative, established by E.O. 14008, sets a goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities. The Justice40 Interim Guidance provides a broad definition of disadvantaged communities (Page 2): <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>.

Students attending Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities (HBCUs) and Tribal Colleges and Universities (TCUs), or institutions located in a disadvantaged community, are highly encouraged to apply to this RFA.

Information on MSIs can be found at:

<https://www2.ed.gov/about/offices/list/ope/idades/eligibility.html#tips>. This information predominately covers institutions that have been awarded grants through the Department of Education and does not include all institutions that may meet the definition of an MSI. **This resource is not an exhaustive list of MSIs.**

For purposes of identifying MSIs in NE's application system, NE is using a directory based off of 2023 U.S. Department of Education data compiled by Rutgers University's Center for MSIs, which can be found here:

<https://www2.ed.gov/about/offices/list/ope/idades/2023eligibilitymatrix.xlsx>. This list is also not an exhaustive list of MSIs but will be used as a starting point for auto identifying MSIs.

If applicants believe that their institution qualifies as an MSI and is not listed, please contact neup@inl.gov with an explanation for how the university meets the conditions of being considered an MSI.

Competition Eligibility Restrictions:

1. Applicants must be the first author or the principal student author of the submitted publication.
 - a. Students applying as undergraduate students may be secondary authors; however, the application will not be considered for the Open Competition Award of Excellence.
 - b. Any paper may only be submitted by one applicant.
2. Applicants must be undergraduate or graduate students. An undergraduate is defined as a student who had not yet completed their bachelor's degree when the publication was submitted for publication or presentation.
3. Applicants must be studying in a nuclear energy relevant discipline.
4. Applicants must submit an online application form and a journal publication that supports nuclear energy research that was published between December 2022 and November 2023. A conference presentation may be submitted; however, it will not be scored as high as a journal publication. Publications that have been accepted by a journal or conference, but have not yet been published or presented, are eligible.
 - a. Conference presentations must be from conferences with peer-reviewed proceedings. This excludes conferences such as the ANS Student Conference.
5. Applicants must have been a student at the time the publication was submitted and must be a student at the time of application submission (November 29, 2023).
6. Applicants must be part of an ongoing research program or a research program that was completed in the previous 24 months.

7. Applicants who have been awarded previous Innovations Student Competition awards are eligible for additional awards under the following conditions:
 - a. Applicants can only be awarded one award each year.
8. Applicants who were awarded a previous Innovations Student Competition award and meet the conditions above must submit a different publication containing significantly new information and state the following in the "Further Explanation" section of the application: "I was awarded a <competition> award in <year> with my publication <title> which was published/presented on <date> in <journal/conference>. This publication is significantly different from the award-winning publication in the following ways:" and then describe the differences.
9. Applicants may re-submit a publication submitted in a previous year as long as the publication did not win an Innovations Student Competition award and still meets this year's eligibility requirements.
10. Applicants must be U.S. citizens or legal permanent residents.
11. Applicant degree seeking institution must be a U.S. institution, including U.S. territories.

3 AWARD DESCRIPTION

Five competitions are available in the Innovations Student Competition. Each publication will be evaluated in each competition for which it qualifies. Students may submit more than one publication, but no student may receive more than one award per year. Awards vary according to award level. Some awards may include travel or conference opportunities.

Successful students will be provided an honorarium as part of the award package. Travel expenses may be covered for students to present at a national conference, typically at the American Nuclear Society (ANS) Winter Meeting.

3.1 Open Competition Award of Excellence (Undergraduate and Graduate Students)

NE expects to award approximately six \$3,500 Award of Excellence award packages. Travel and conference opportunities may accompany this award. Award of Excellence recipients will have an opportunity to present their publication at the annual ANS Winter Meeting as well as other national meetings.

All submitted publications from eligible students at all universities are eligible for this competition, excluding undergraduate students who are not lead authors. The intent is to provide awards for well-qualified publications in the following categories:

- **Reactor Development and Plant Optimization** (including advanced reactor design and development; improving economics of construction and operations; flexible operations; and implementation of artificial intelligence and machine learning)

- **Flexible Energy Systems** (including non-electric and industrial heat applications; thermal storage integration; remote deployment and dedicated power supplies, and siting)
- **Fuel Cycle Technologies** (including advanced fuels; aqueous separations; molten salt separations and solution chemistry; advanced waste form development; and fuel cycle options and systems analysis)
- **Spent Fuel Disposition** (including storage, transportation, disposal of commercial spent nuclear fuel, and behavior of actinides and radionuclides under generic repository conditions; light water reactor core, structural, and cladding materials; advanced reactor core, structural, and cladding materials; advanced manufacturing technologies; and materials for fuel recycling applications)
- **Nuclear Engineering** (including reactor physics, thermal hydraulics and heat transfer, and nuclear chemistry)
- **Energy Policy and Social Sciences** (including environmental justice, consent-based siting, decision support simulators, which may include game theory, economic modeling, and applied mathematics)

3.2 Competition for Graduate Students Attending Minority Serving Institutions or Belonging to a Disadvantaged Community

NE expects to award approximately five \$3,500 graduate awards for publications from eligible students who attend a Minority Serving Institution or who are members of a disadvantaged community. Travel and conference opportunities may accompany this award.

3.3 Open Competition Special Recognition

NE expects to award approximately six \$2,500 at-large awards for applicants that did not receive Open Competition Award of Excellence awards. Travel and conference opportunities may accompany this award.

3.4 Competition for Undergraduate Students Attending Minority Serving Institutions or Belonging to a Disadvantaged Community

NE expects to award approximately five \$1,500 undergraduate awards for publications from eligible students who attend a Minority Serving Institution or are a member of a disadvantaged community. Travel and conference opportunities may accompany this award.

3.5 Undergraduate Competition

NE expects to award approximately five \$1,500 awards for publications from eligible undergraduate students at all universities. Travel and conference opportunities may accompany this award.

Applicants could be eligible for multiple different categories and could compete in all of them but would only be eligible to win one competition per year.

3.6 Travel and Conference Opportunities

Details about potential travel and conference opportunities will be provided to award recipients. Open Competition Award of Excellence and MSI/Disadvantaged Community Graduate Award winners may have an opportunity to present their publication at the annual ANS Winter Meeting or similar type meeting. Note that all travel will be paid in accordance with current Federal Travel Regulations. Invited students should book travel arrangements directly with the Innovative Nuclear Research Integration Office.

Note: The U.S. Department of Energy, the federal government, and Battelle Energy Alliance are not obligated to make any award as a result of this announcement.

4 APPLICATION SUBMITTAL REQUIREMENTS

4.1 Application Due Date

Applications are due by November 29, 2023, at 5:00 p.m. Eastern Time (ET).

4.2 Application Schedule

| | |
|--|----------------------|
| Issue Request for Applications | October 2023 |
| Application Deadline | November 29, 2023 |
| Award Announcement & Winning Authors Notified | Spring 2024 |
| Open Competition Award of Excellence and Graduate MSI/Disadvantaged Community Competition submit summaries to ANS Winter Meeting | July 2024 |
| American Nuclear Society 2024 Winter Meeting | November 17-21, 2024 |

4.3 Late Applications

Applications received after the designated date and time will not be accepted.

Note: It is the applicant’s responsibility to confirm—prior to the application deadline—that all requirements have been met and materials submitted. If a requirement has not been met, the application will be considered incomplete and will not be reviewed.

4.4 Application Preparation Instructions

Complete applications must be submitted electronically through neup.gov before the deadline established above. To apply, students will need to create an account at neup.gov. Students re-applying should use their existing account. Once logged in, applicants will need to click on the “Applications” tab located at the top, left hand corner of the page. To begin an application, click on the “Create New Application” link for the FY 2024 Innovations Student Competition.

In addition to the information required on the application submittal form, a template with publication information and the professional publication must be uploaded to the application.

Submitted publications must have been published in a journal, presented at a conference, or have been accepted for publication or presentation at the time of application. The student's standing in college at the time of publication acceptance determines their graduate/undergraduate status for the Innovations Student Competition. Also, applicants must have been a student at the time the publication was submitted and must be a student at the time of application submission (November 29, 2023).

5 APPLICATION INSTRUCTIONS

5.1 Interpretations and Exceptions

Students shall submit applications in compliance with the RFA requirements. Any application not adhering to RFA requirements may be considered non-responsive. The student may obtain NE concurrence/clarification regarding its interpretation to classify the student's application as compliant with, or an exception to, the RFA requirements by contacting neup@inl.gov. Any exception must be approved by NE and documented as part of the application.

5.2 Rights Reserved by NE

NE reserves the right to accept or reject any application with or without prior discussion with the student and to disregard minor irregularities in applications received. NE reserves the right to conduct any necessary pre-award survey and analysis to evaluate a student's capabilities to comply with the requirements of this RFA.

The U.S. Department of Energy, the federal government, or Battelle Energy Alliance is not obligated to make any award as a result of this announcement.

5.3 Application Validity Period

An application shall remain firm for 365 days after the application due date.

5.4 Discrepancies in the RFA

Should a student find discrepancies in, or omissions from, the RFA, its attachments or related documents, or should the student be in doubt as to the meaning of any requirements, the student shall notify NE by contacting neup@inl.gov and obtain correction or clarification prior to submitting an application.

6 DELIVERABLES AND OBLIGATIONS

No reporting criteria are required for the Innovations Student Competition awards. If awarded, upon accepting the award, the student must provide information to process and publicize the award, including necessary tax information for the honorarium and a photo for publication purposes.

7 APPLICATION REVIEW AND SELECTION PROCESS

Publications will be reviewed by a panel of nuclear energy experts in the following manner:

1. All eligible publications will be evaluated for the Open Competition Award of Excellence.
2. Publications that do not receive an award in the Open Competition Award of Excellence will, if qualified, be evaluated in the other competition categories where they are eligible.

7.1 Evaluation Criteria

Publications will first be evaluated to determine that they are relevant to the Office of Nuclear Energy's mission. If deemed relevant, the publication will then be evaluated using the following criteria:

- Innovation (45%) – publication's importance, novelty, impact, questions answered.
- Communication Skills (15%) – student's skill at disseminating research results; writing clarity.
- Applicant's Role in the Research (25%).
- Quality of the Journal or Conference (15%).

8 AWARD ADMINISTRATION INFORMATION

8.1 Notification of Award

Notification of the Innovations Student Competition award will be made by email to the student and by a press release on the neup.gov website. A personal photo will be requested of the awardee for publicity of the award.

Students whose applications are not selected for an award will also be notified of that decision via email.

8.2 Award Conditions

An Innovations Student Competition award consists of an official award letter, official award certificate, honorarium, and display of awardee's picture and awarded publication on the neup.gov website.

Awardees will be notified of timing to register and submit awarded publications at the annual ANS Winter Meeting.

If selected, the student must accept or decline the award within **14** days of notification. Failure to comply with the deadline may result in revocation of the award offer. Awardees will need to supply their photo and necessary tax information in order for their honorarium to be released.

APPENDIX A: RULES FOR AWARD WINNERS

Intellectual Property and Copyright

The award-winning work may not infringe, misappropriate, plagiarize, or otherwise violate any intellectual property rights, statutory or common law copyrights, proprietary rights privacy rights, moral rights, or any other rights of any third party or entity.

The Innovations in Nuclear Energy R&D Student Competition Award does not transfer intellectual property rights to the U.S. Department of Energy.

The author may not claim or imply that the research results are endorsed by DOE's Office of Nuclear Energy. The Office of Nuclear Energy must be referenced if the research project was funded in full or in part by the Office of Nuclear Energy.

U.S. Department of Energy Logo

The U.S. Department of Energy logo or official seal are not to be used in the presentation or publication of the research unless the project was funded by the U.S. Department of Energy.

Third Party Approval

Applicants submitting co-authored papers for award consideration must have the endorsement of the faculty author(s) or the agreement of all co-authors.

Publicity

The U.S. Department of Energy and its agent, Battelle Energy Alliance, may publicize the award using the applicant's name, likeness, and such details as warranted to publicize the program and the awards. Applicant's likeness and award details will be published on the neup.gov website and may be submitted for publication via other publicity vehicles.

Defamation

Award winning authors may not be defamatory or libelous in any manner toward any person or constitute or result in any misappropriation or other violation of another person's publicity rights or right of privacy.

National Meeting Presentations

Award recipients may have an opportunity to present their publication at the annual ANS Winter Meeting as well as other national meetings.