

**University of Rochester
Laboratory for Laser Energetics**

**National Laser Users' Facility (NLUF) Call for Proposal
for Experiments at the Omega Laser Facility
Fiscal Year (FY) 2026 to FY2027**



Date Issued:	December 18, 2024
Applications Due:	February 10, 2025 (by 11:59:59 PM EST)
Point of Contact:	Dr. Mingsheng Wei NLUF Manager Laboratory for Laser Energetics University of Rochester Tel: (585)275-3866 Email: mingsheng@lle.rochester.edu

Note: Electronic application in a single **PDF file** must be submitted via the [NLUF proposal submission webpage](#) on the LLE website on or before **February 10, 2025**.

PART I: NLUF PROGRAM DESCRIPTION

A. Summary

The University of Rochester's Laboratory for Laser Energetics (LLE) is issuing a call for proposal for experiments in the National Laser Users' Facility (NLUF) Program at the Omega Laser Facility for fiscal years (FY) 26 and FY27. LLE expects to allocate approximately 15% of the Omega Laser Facility time for NLUF experiments each year. Proposals to NLUF may request a series of beam-time access, spanning over one to two years but must be focused on a specific experimental topic. As is always the case, management of the NLUF Program is contingent upon funding and authorization. If the enacted budgets contain a significant cut to LLE's Inertial Confinement Fusion (ICF) Program, the time allotted to the NLUF Program under this call may be reduced. The ongoing sustainment activities at the Omega Laser Facility may also result in an increase in scheduled facility downtime. The facility operational planning team will optimize the schedule, but the total NLUF shot time may be impacted.

B. NLUF Program Overview

LLE was established in 1970 as a center for the investigation of the interaction of intense radiation with matter. It is the home of the Omega Laser Facility, which includes OMEGA—a 30-kJ UV, 60-beam laser system (at a wavelength of 0.35 μm), and OMEGA EP—a four-beam high-energy UV, long-pulse laser system, two of which can be compressed for high-intensity, short-pulse operation (at a wavelength of 1.053 μm). Up to two of the OMEGA EP short-pulse beams or one of the OMEGA EP long-pulse UV beams (wavelength tunable) can be coupled with the 60-beam OMEGA laser for joint operation in the OMEGA target chamber.

The National Nuclear Security Administration (NNSA) Office of Experimental Sciences within the US Department of Energy funds the operations of LLE and specifically, of NLUF, thus making it possible for users to conduct experiments without a direct facility charge. The NLUF Program provides access to the Omega Laser Facility for university and industrial scientists to perform basic research in high-energy-density (HED) physics and ICF. Proposals will be judged on their scientific merit, technical feasibility, and broader impact.

LLE researchers are available for scientific collaboration and for assistance with user experiments. NLUF principal investigators (PI's) are encouraged to collaborate with LLE staff members, but not required.

For information about the Omega Laser Facility and further information about the NLUF Program, including a User's Guide, please visit: <https://www.lle.rochester.edu/>. Questions relating to the Omega Laser Facility, the current experimental capabilities, and this call for proposal should be addressed to NLUF Manager, **Dr. Mingsheng Wei**.

As in the past, NNSA will fund General Atomics (GA) to provide fabrication support for standard or off-the-shelf types of targets as needed for approved NLUF experiments. PIs must contact **Julie Fooks** (phone: 585-273-5723, email: jfoo@lle.rochester.edu) and **Claudia Shuldborg** (phone: 619-782-2814, email: Claudia.Shuldborg@ga.com) at GA to discuss their target needs for the proposed work before submitting proposals. If there are any LLE-specific target issues (such as the need for specific fill gases, especially ^3He ; use of hazardous materials; use of magneto-inertial fusion electrical discharge system or gas-jet system; on-site metrology needs; etc.) for the proposed NLUF experiments, PIs must contact **Dr. David Harding** (phone: 585-275-5850, email: dhar@lle.rochester.edu) before submitting proposals.

C. Program Purpose and Objectives

The objective of the NLUF Program is to provide access to the Omega Laser Facility for university and industry-led basic science experiments through an independent peer-review proposal process. Specifically, this program is intended to provide access to the Omega Laser Facility to a broad community of academic and industrial research interests for:

- (a) conducting basic laser-matter interaction, and ICF and HED physics research, and
- (b) providing research experience necessary to maintain a cadre of trained scientists to meet the nation's future needs in these areas of science and technology.

Recipient's project objectives should align with the aforementioned program objectives. Upon selection, recipients are encouraged to attend the annual Omega Laser Facility Users Group Workshop.

1. Research Areas

The unique research tools and resources of LLE's Omega Laser Facility are available to eligible users (as defined in Part III) to conduct state-of-the-art basic research in high-energy-density laboratory plasma (HEDLP). Generally, HEDLP research is directed at exploring the behavior of matter at extreme conditions of temperature, density, and pressure, including laboratory astrophysics and planetary science, structure and dynamic of matter at the atomic scale, laser-plasma interactions and relativistic optics, magnetohydrodynamics (MHD) and magnetized plasmas, and plasma atomic physics and radiation transport.

The specific areas of interests include, but are not limited to:

- (1) HED hydrodynamics
- (2) radiation-dominated dynamics and material properties
- (3) magnetized HED plasmas
- (4) nonlinear optics of plasmas and laser-plasma interactions
- (5) relativistic HED plasmas and intense beam physics
- (6) warm dense matter
- (7) high-Z, multiply ionized HED atomic physics
- (8) plasma and nuclear physics
- (9) diagnostic and experimental platform development
- (10) other (please specify)

Basic research is defined as research directed toward increasing knowledge in a particular field of science. The primary aim of basic research is a fuller knowledge or understanding of the subject matter under study, rather than any immediate application of that knowledge to NNSA's mission. Science relevant to inertial fusion energy will be considered but will be judged solely on the basis of its quality as basic science. In particular, the results of the experiment must be of significant interest in other fields, consistent with guidelines for publication in a highly ranked journal.

All proposed work to be conducted through this program announcement should be basic research. No proposals for propriety research or CLASSIFIED work will be accepted. All applicants are responsible for ensuring compliance with all applicable US Export Control laws and regulations and all other applicable security requirements relating to any work performed under a resulting beam-time award.

PART II: FACILITY TIME ALLOTMENT (AWARD) INFORMATION

A. Type of Award

Omega Laser Facility access allocated in units of “shot day(s)” with the associated target support will be awarded.

Note: As in the past, NNSA will fund GA to provide fabrication support for standard or off-the-shelf types of targets as needed for awarded NLUF experiments. Target needs must be specified in the proposal, and are evaluated as part of the NLUF review process.

B. Expected Number of Awards

The exact number of awards will depend on the number of meritorious applications and the availability of the shot time allotted for the NLUF Program.

For shot time allocation purposes, a joint OMEGA and OMEGA EP target shot day is equivalent to one and a half days (one OMEGA shot day and 0.5 OMEGA EP shot day).

C. Anticipated Award Size

The minimum facility time allotment is anticipated to be half a day for OMEGA and one day for OMEGA EP, respectively. The maximum allotment for each award will be limited to two days per year.

Facility time is awarded, not a specific number of shots. The number of shots that can be accomplished per day is a function of experimental complexity. For planning purposes, one OMEGA shot day typically produces 11 to 14 shots while one OMEGA EP shot day typically yields 6 to 14 shots depending on the configuration.

D. Period of Performance

The program is for OMEGA and OMEGA EP experiments in FY26–FY26 starting October 2025 through September 2027.

LLE will make every effort to schedule experiments as outlined in this call and, once scheduled, to execute the runs on time. The Omega Laser Facility can fully support remote PI shot operation. In this mode, users are not on-site but instead lead their experiments online while facility and experimental support staff set up and deliver the shots.

E. Limitations on the Applications by the Same Organization or Institution

There is no limit on the number of distinct proposals the same institution/organization or PI can submit to this call. Multiple submissions from the same team for similar experiments will not be considered.

F. Required Acknowledgement and Disclaimer for Successful Applications

If awarded, recipients must include an acknowledgment of NLUF user program and federal support as well as a disclaimer in the publication stating that it was based on or developed under the NLUF project. Publications must also go through LLE’s Review and Release procedure to be documented prior to submission and should be submitted through LLE’s Publications ticketing system (for LLE PIs and

coauthors) at <https://urlle.lle.rochester.edu/index.php/resources/publications-and-design-support/> or forwarded to the NLUF Program Manager for projects without an LLE coauthor.

Acknowledgment (template) for NLUF user program support:

“The experiment was conducted at the Omega Laser Facility with the beam time through the National Laser Users’ Facility user program. This material is based upon work supported by the Department of Energy [National Nuclear Security Administration] University of Rochester “National Inertial Confinement Fusion Program” under Award Number(s) DE-NA0004144.”

Disclaimer:

“This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.”

PART III: ELIGIBILITY INFORMATION

A. Eligible Applicants

Only proposals led by researchers from universities,* nonprofits, and private sector companies in the US will be considered for this call. Researchers from non-US institutions can be collaborators on NLUF projects.

NLUF proposals should not duplicate efforts currently being conducted or proposed to be conducted at the Omega Laser Facility through the NNSA-supported Laboratory Basic Science Program or the Office of Fusion Energy Sciences-funded LaserNetUS Program.

Consistent with the UR/LLE and NNSA policies, additional information will be required for all non-US citizens who will be involved in the proposed project if the application is selected for an NLUF beam-time award.

*Note: Researchers from the University of Rochester's academic departments who are not affiliated with LLE can submit NLUF facility time proposals.

PART IV: APPLICATION AND SUBMISSION INFORMATION

A. Application Package

All application forms and instructions are included in this solicitation.

B. Content and Form of Application

1. Cover (one page)

The cover page of the proposal shall include all the information requested in Appendix A.

2. Project Narrative (not more than eight pages)

The project narrative MUST NOT exceed **eight** pages, including text, figures, and tables, using standard letter size (8.5-in. by 11-in.) paper with 1-in. margins (top, bottom, left, and right). The content should be written in Times New Roman 11-pt font, single spaced, and aligned in “justified” mode. Figure captions may be Times New Roman 9-pt font. The project narrative must include:

- (a) **Abstract:** Provide a single paragraph summarizing the proposed experiment, quantities to be measured, samples to be studied, expected scientific results, and impact.
- (b) **Scientific Case:** Describe the background, the objectives of the experiment, the scientific questions to be addressed, the proposed experimental method including the specific measurements to be made, the expected outcome and impact, and the relevance to the objectives in the program announcement. Also discuss why the proposed experiment is uniquely suited to OMEGA and/or OMEGA EP. The experimental designs should be described, including simulations, predictions, and previous experimental results (if any) that shows the goals of the proposed experiment can be achieved. The proposal should focus on the specific experiment.
- (c) **Proposed Experiments and Expected Results:** Describe the proposed experimental configurations, geometry, requirements of the laser, diagnostics and targets, number of the shot days, and the expected number of shots, preliminary shot plan, and the data to be collected. A schematic layout of the experiment should be included.
 - (1) **Laser and Experimental Configuration:** Provide information on the required OMEGA and/or OMEGA EP laser, including number of beamlines, total energy on target, beam-to-beam energy variance, pulse shape, beam-smoothing requirements, beam timing and synchronization requirements, beam pointing, laser diagnostics, and the primary target physics diagnostics and specific measurements with the needed primary diagnostics, number of shot days, and expected number of shots. Also indicate whether the experiment will use an existing platform and existing diagnostics or will require new capabilities and/or new diagnostics.
 - (2) **Equipment:** Information on the experimental equipment requirements of the projects, including both standard equipment items, which may be provided by UR/LLE, and any special equipment to be purchased or provided by the applicant.
 - (3) **Targets:** Describe proposed target types, number, and confirm the discussion PI has with NLUF target primary supplier GA (and LLE for LLE-specific target support). Note:

Limited funding for standard or off-the-shelf type targets for the approved NLUF experiments will be provided by NNSA directly to GA. The prospective PI must provide an adequate description of the proposed targets to allow GA and LLE to assess feasibility and estimate a cost as part of the proposal review process. Users having the capability to provide their own unique targets are encouraged.

- (d) **Project Timetable and Shot Plan:** (1) Outline as a function of time, year by year, all the important activities or phases of the project including supporting activities; and (2) provide a shot plan including decision points and contingency plan if results significantly differ from prediction.
- (e) **Merit Review Criteria Discussion:** The section should briefly address each of the merit review criterion listed in Part V, Sec. A.

3. Appendices to Project Narrative Information

All applicants must complete the following appendices and attach them to the final project narrative document. All of the requested information for the following appendices will not count in the project narrative page limitation.

(a) **Appendix 1: Bibliography and References Cited**

Provide a bibliography for any reference cited in the project narrative.

(b) **Appendix 2: Funding Sources**

Users are responsible for their own travel and any extraordinary consumables required by the experiment. List available funding sources to support the execution of the proposed experiment. [Note: NNSA Academic Programs may provide travel support for researchers who will be granted NLUF shot time at the Omega Laser Facility to execute the experiments if such support will be needed.]

(c) **Appendix 3: Summary of Previous NLUF Project (not more than one page)**

If this proposal is the continuation of a previously awarded experiment through NLUF, please include a brief summary of the experiments conducted, the status of the analysis, and results disseminated (list major invited talks, papers published or in press, awards or special recognition, graduate students and postdoctoral researchers being trained, and/or advanced degrees obtained).

(d) **Appendix 4: Six-Page Overview of the Proposed NLUF Experiment**

The overview shall include all the information requested in Appendix B.

C. Submission Requirements

Submit electronic applications in a single **PDF file** via the [NLUF proposal submission webpage](#) on the LLE website. Applications must be received by **February 10, 2025**, no later than 11:59:59 PM Eastern Time.

PART V: APPLICATION REVIEW INFORMATION

A. Criteria

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, UR/LLE will perform an initial compliance review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of this announcement.

2. Merit Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following criteria:

- (1) The overall scientific/technical merit of the project and its relevance and prospective contribution to its field of research;
- (2) The scientific/technical soundness and quality of the proposed method/approach, and the feasibility/likelihood of accomplishment of the stated objectives;
- (3) The competence, experience, and past performance of the proposer, principal investigator, and key team members;
- (4) The broader impact of the project on education and workforce development (e.g., training opportunities to students or early-career researchers), and expanding scientific ecosystem (e.g., new research topic areas, engaging with new users particularly from underrepresented groups or institutions, the proposed experiment being part of larger project or program, etc.); and
- (5) The demands of the project in terms of resource requirements (equipment, beam time, target support, etc.) and/or other requirements (facility hardware modifications, component development, etc.) vis-à-vis competing demands.

B. Review and Selection Process

1. Review

Applications that pass the initial compliance review will be subjected to both merit review by an independent NLUF Proposal Review Panel (PRP) in accordance with the guidance provided above and the technical feasibility review including resource demands by LLE.

2. Selection

The LLE Director will make the final decision concerning the award of OMEGA/OMEGA EP shot opportunities for this Program based on the PRP recommendations and the facility feasibility and executability assessments. A list of the approved experiments naming the PI and the title of the experiment will be made publicly available on the LLE website once scheduling is complete.

APPENDICES

- A. Proposal Cover Page (template)**
- B. Six-Page Overview of the Proposed Experiment (template)**

Appendix A: Proposal Cover Page
NLUF Experiments at the Omega Laser Facility—FY26 and FY27

(a) Title of Proposed Experiment:

Provide a descriptive title of your proposed experiment that will be made public if awarded experiment time. This gray box should be deleted before submission.

(b) Research Topic Area (see Part I, C.1.):

(c) Principal Investigator (PI) and Co-PI (if applicable)

	Principal Investigator	Co-PI
Name		
Division/Department		
Institution		
Job Title		
Mailing Address		
Email		
Telephone		

The **principal investigator (PI)** typically conceives of the idea, designs the experiment, and leads the experimental team and analysis effort. A **“Co-Principal Investigator” (Co-PI) is a mandatory requirement for all submissions when a student or postdoctoral researcher assumes the role of PI.** In such scenarios, the Co-PI is typically the student’s supervisor or manager, taking on the responsibility of training, oversight, securing funding, and providing the necessary resources to facilitate the experiment. Moreover, the Co-PI serves as the primary point of contact in the event the student or postdoc PI leaves the project. This gray box should be deleted before submission.

Tentative Research Team: (List all team members that you expect to be involved in the proposed research including Lead PI, Co-PI, students, postdocs, research staff; and describe their roles.)

Name	Affiliation	Email	Job Title	Tentative Role [PI, Co-PI, experimental, theory/simulation, other (specify)]	Citizenship

Appendix B: Six-Page Overview of the Proposed NLUF Experiment in FY26–FY27

(See the PowerPoint template file available on the NLUF proposal submission webpage.)

The overview slides will be used to facilitate the experimental feasibility assessment.

This gray box should be deleted before submission.