

**University of Rochester  
Laboratory for Laser Energetics**

**Laboratory Basic Science (LBS) Call for Proposal  
for Experiments at the Omega Laser Facility  
Fiscal Year (FY) 2026**

Date Issued:	December 18, 2024
Applications Due:	<b>February 10, 2025 (by 11:59:59 PM EST)</b>
Point of Contact:	Dr. Mingsheng Wei Manager, National Laser Users' Facility Laboratory for Laser Energetics University of Rochester Tel: (585)275-3866 Email: <a href="mailto:mingsheng@lle.rochester.edu">mingsheng@lle.rochester.edu</a>

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

## PART I: LBS PROGRAM DESCRIPTION

### A. Summary

The University of Rochester's Laboratory for Laser Energetics (LLE) is issuing a call for proposals for experiments in the Laboratory Basic Science (LBS) Program at the Omega Laser Facility for Fiscal Year (FY) 26. LLE expects to allocate about 10% of the Omega Laser Facility time for LBS experiments in FY26. As is always the case, management of the LBS 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 LBS 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 LBS shot time may be impacted.

### B. Background

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  $0.35\ \mu\text{m}$ ), 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  $1.053\ \mu\text{m}$ ). 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 Omega Laser Facility is maintained and operated by LLE for the National Nuclear Security Administration (NNSA) within the US Department of Energy (DOE). LLE's Cooperative Agreement with the DOE/NNSA specifies that a fraction of the OMEGA and OMEGA EP beam time each year be available for the merit-based LBS Program with projects selected through an annual call for proposal and review process.

The LBS Program provides access to the Omega Laser Facility for basic science research in high-energy-density (HED) physics led by researchers from participating laboratories in the NNSA ICF Program and the DOE Office of Science laboratories. Proposals will be judged on their scientific merit, technical feasibility, and broader impact.

For information about the Omega Laser Facility and further information about the LBS 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 National Laser Users' Facility (NLUF) Manager, **Dr. Mingsheng Wei**.

### C. Research Areas

The unique research tools and resources of LLE's Omega Laser Facility are available to laboratory scientists (as defined in Sec. B) to conduct state-of-the-art basic science research in the following topical areas (but 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 is to be UNCLASSIFIED. No proposals for 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**

Only Omega Facility time (including OMEGA EP) in units of “shot day(s)” will be awarded.

Users’ institutions are generally responsible for travel and target expenses as well as any significant consumables required by the experiment.

### **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 LBS 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 from October 2025 through September 2026.

LLE will make every effort to schedule experiments as outlined in this call and, once scheduled, to execute the runs on time. Note: 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 principal investigator (PI) can submit to this call. Multiple submissions from the same team for similar experiments will not be considered.

### **F. Required Acknowledgment and Disclaimer for Successful Applications**

If awarded, recipients must include an acknowledgment of the LBS user program and federal support as well as a disclaimer in the publication based on or developed under the LBS 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.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 LBS user program support:

“The experiment was conducted at the Omega Laser Facility with beam time through the Laboratory Basic Science 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 submitted from the NNSA ICF laboratories (Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Sandia National Laboratories, Naval Research Laboratory, and LLE), and the DOE Office of Science laboratories (Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Princeton Plasma Physics Laboratory, SLAC National Accelerator Laboratory, and Thomas Jefferson National Accelerator Facility) will be considered for this program. Researchers from non-US institutions can be collaborators on LBS projects.

LBS proposals should not duplicate efforts being conducted or proposed to be conducted through the NNSA-supported NLUF Program or the Office of Fusion Energy Sciences-funded LaserNetUS Program, nor proposals submitted through the NNSA HED program Omega Facility allocations.

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 LBS beam-time award.

## 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 six pages)

The project narrative MUST NOT exceed **six** 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 design should be described, including simulations, predictions, and previous experimental results (if any) that show the goals of the proposed experiment can be achieved. The proposal should focus on the specific experiment.
- (c) **Proposed Experiments and Expected Results:** Please 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, 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, suppliers, and method of obtaining targets. PIs and their institution are responsible for targets. Applicants are urged to discuss

target needs for the proposed experiment with their target suppliers (and LLE for LLE-specific target support) before submitting proposals and confirm the discussion.

- (d) **Project Timetable and Shot Plan:** (a) Outline all the important activities or phases of the project including supporting activities and (b) 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 generally responsible for their own travel and target expenses, as well as any extraordinary consumables required by the experiment. List available funding sources to support the execution of the proposed experiment.

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

If this proposal is the continuation of a previously awarded experiment through LBS, 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 LBS 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 [LBS proposal submission webpage](#) on the LLE website. Applications must be received by **February 10, 2025**, not 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, PI, 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 such as Laboratory Directed Research and Development, 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 LBS 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**  
**LBS Experiments at the Omega Laser Facility in FY26**

**(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)

	<b>Principle Investigator (PI)</b>	<b>Co-PI (if applicable)</b>
Name		
Division/Dept.		
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 LBS Experiment in FY26**

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

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

This gray box should be deleted before submission.