

**University of Rochester  
Laboratory for Laser Energetics**

**Laboratory Basic Science Experiments  
at the Omega Laser Facility  
Fiscal Year 2018**

Date Issued: February 7, 2017

Applications Due: April 3, 2017

Point of Contact: John M. Soures  
Manager, NLUF  
(585)-275-3866  
jsou@lle.rochester.edu

## **PART I – LABORATORY BASIC SCIENCE PROGRAM DESCRIPTION**

### **A. Background.**

The University of Rochester's (UR) Laboratory for Laser Energetics (LLE) 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, high-intensity short-pulse and high-energy long-pulse laser.

The Omega Laser Facility is maintained and operated by UR/LLE for DOE/NNSA. As a part of its mission, UR/LLE provides shot opportunities on the Omega Laser Facility to participating laboratories in the NNSA ICF program (LLNL, LANL, SNL, NRL, 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), to conduct basic science experiments in the general areas related to high-energy-density physics.

Subject to funding, ~10% of the annual operating time of the Omega Laser Facility may be available for Laboratory Basic Science experiments in FY18. The Laboratory Basic Science Program is administered by the UR/LLE National Laser Users' Facility (NLUF) Manager who issues an annual solicitation proposal. The proposals are reviewed by the Laboratory Basic Science Review Committee consisting of scientists from the user laboratories, as well as at least two independent members. The Committee members are appointed by the UR/LLE Director. This committee will peer review all Laboratory Basic Science proposals on merit and make recommendations to the LLE Director of proposals in rank order including a recommended system time allocation.

For information about the facilities and the solicitation process please contact:

Dr. John M. Soures, Manager  
National Laser User's Facility  
Laboratory for Laser Energetics  
250 East River Road  
Rochester, NY 14623

Telephone: (585)-275-3866  
Fax: (585)-275-5960

### **B. Areas of Research.**

The research tools and resources of the UR/LLE Omega Laser Facility are available to laboratory scientists (as defined in Section A) for state-of-the-art basic research experiments in laser-matter interaction and related diagnostics. This includes, but is not limited to, inertial fusion, plasma physics, spectroscopy of highly ionized atoms, laboratory astrophysics, high-energy-density physics, fundamental physics, materials science, biology, and chemistry.

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.

**C. Solicitation Schedule.**

<u>Event</u>	<u>Target Date</u>
Program Announcement Issued	February 7, 2017
Applications due (via pdf files)	April 3, 2017
Selection of projects for award	May 31, 2017
Experiments conducted	October 1, 2017 to September 30, 2018

Proposals must be received in full by 17:00 ET on 3 April 2017 at UR/LLE at the following address:

[omegabasicsscience@lle.rochester.edu](mailto:omegabasicsscience@lle.rochester.edu)

## **PART II – SHOT ALLOTMENT (AWARD) INFORMATION**

### **A. Type of Award Instrument.**

Only Omega Facility time (including OMEGA EP) is available through this competition. There is no funding or other material support provided via this program.

### **B. Expected Number of Awards.**

A total notional allotment of approximately 12 OMEGA and 8 OMEGA EP shot days may be available for this program in FY18. For planning purposes, one OMEGA shot day typically produces 11 target shots while one OMEGA EP shot day is expected to produce approximately 6 target shots. For shot time allocation purposes, a joint OMEGA and OMEGA EP target shot day is equivalent to one OMEGA shot day and one OMEGA EP shot day.

### **C. Anticipated Award Size.**

The minimum shot allotment is anticipated to be one half day for OMEGA, and one day for OMEGA EP, respectively. Proposals that require less than the required minimum time on a laser will not be accepted. While there is no maximum shot allocation beyond those stated in Section B above, the normal shot allotment is 1 to 2 days

### **D. Period of Performance.**

The program is for OMEGA and OMEGA EP shots during FY18 only.

## **PART III – Eligibility Information**

### **A. Eligible Applicants.**

Only proposals led by scientists from the NNSA ICF laboratories (LLNL, LANL, SNL, NRL, and LLE), and from 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. These proposals should not duplicate efforts being conducted or proposed to be conducted through the NNSA-funded UR/LLE NLUF program, nor proposals submitted through the ICF and HED Omega Facility allocations.

## PART IV – APPLICATION AND SUBMISSION INFORMATION

### A. APPLICATION PACKAGE.

All application forms and instructions are included in this solicitation.

### B. LETTER OF INTENT AND PRE-APPLICATION

#### 1. Letter of Intent.

Letters of Intent are not required.

#### 2. Pre-application.

Pre-applications are not required.

### C. CONTENT AND FORM OF APPLICATION

#### 1. COVER.

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

#### 2. FACILITY REQUIREMENTS/PROPOSAL SUMMARY

The second and third pages of the proposal shall be the filled-out Proposal Summary Form (Form B) of Appendix B and the filled-out Facility Experimental Configuration Summary (Form C) of Appendix C. The primary facility (OMEGA or OMEGA EP or both) where the work will be performed must be indicated. If the project requires extraordinary support (such as unusual target fabrication or non-standard laser or diagnostics configurations) such requirements and the source of such support must be identified.

#### 3. PROJECT NARRATIVE

The project narrative **MUST NOT** exceed **15** pages, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5-in. by 11-in. paper with 1-in. margins (top, bottom, left, and right). **EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed.

The project narrative must include:

Project Objectives. This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

Merit Review Criterion Discussion. The section should be formatted to address each of the merit review criterion and sub-criterion listed in Section V.A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria.

Relevance and Outcomes/Impacts. This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts.

Project Timetable. This section should outline as a function of time, year by year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.

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.

Laser Configuration. Detailed information on the OMEGA and/or OMEGA EP Laser, diagnostics, and target requirements for the proposed work, including number of shots, number of beamlines, total energy on target as well as a beam-to-beam energy variance, pulse shape, beam smoothing, plasma and laser diagnostics, target specifications, and other requirements that are important to the conduct of the proposed experiment. The NLUF Users Guide available at:

[http://www.lle.rochester.edu/02\\_visitors/02\\_nluf.php](http://www.lle.rochester.edu/02_visitors/02_nluf.php) may be consulted for facility information.

Collaborations. Information on collaboration with scientists at UR/LLE or other institutions that are required for the conduct of the proposed work, including official institutional confirmation of the acceptance of such collaborations.

Roles of Participants. For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed. This section must not exceed **1** page.

Evaluation Phase. This section must include a plan and metrics to be used to assess the success of the project.

#### **4. BIBLIOGRAPHY AND REFERENCES CITED: FACILITIES AND OTHER RESOURCES AND EQUIPMENT.**

Bibliography and References. Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

Facilities and Other Resources. Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed and, if appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project, such as machine or electronic shops. This section must not exceed 1/2 page.

Equipment. List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each.

**5. RESEARCH AND RELATED: Senior/Key Person.**

Complete the required profile information for each senior/key person proposed. A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project. For each senior/key person provide:

***Biographical Sketch.***

Complete a biographical sketch for each senior/key person and attach in the block provided. The biographical information for each person must not exceed 1 page when printed on 8.5-in. by 11-in. paper with 1-in. margins (top, bottom, left, and right) with the font not smaller than 11 point.

**D. SUBMISSION DATES AND TIMES.**

**1. Pre-application Due Date.**

- Pre-applications are not required.

**2. Application Due Date.**

Applications must be received by April 3, 2017, not later than 17:00 Eastern Time.

You are encouraged to transmit your application well before the deadline.

APPLICATIONS RECEIVED AFTER THE DEADLINE MAY NOT BE REVIEWED OR CONSIDERED FOR AWARD.

**E. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS**

**1. Where to Submit**

**APPLICATIONS MUST BE SUBMITTED VIA e-MAIL**

Submit electronic applications in **pdf form** to:

[omegabasicscience@lle.rochester.edu](mailto:omegabasicscience@lle.rochester.edu)



## Part V – APPLICATION REVIEW INFORMATION

### A. CRITERIA

#### 1. Initial Review Criteria.

Prior to a comprehensive merit evaluation, UR/LLE will perform an initial 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 the OMEGA/OMEGA EP shot opportunity announcement. (5) The proposal experiments are consistent with OMEGA's capabilities.

#### 2. Merit Review Criteria.

Applications will be reviewed in accordance with the following criteria:

Applications will be technically evaluated based on the four general scientific/technical criteria listed below in descending importance with a relative weighting in the approximate ratio of 4:3:2:1:

- (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/or key personnel; and,
- (4) The demands of the project in terms of resource requirements (equipment, beam time, etc.) and/or other requirements (facility hardware modifications, component development, etc.) vis-à-vis competing demands.

### B. REVIEW AND SELECTION PROCESS.

#### 1. Merit Review.

- Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in Section A above.

#### 2. Selection.

The UR/LLE Director will make the final decision concerning the award of OMEGA/OMEGA EP shot opportunities for the Laboratory Basic Science Program based on the peer review committee recommendations.

**C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.**

Successful principal investigators will be notified on or about May 31, 2017 for experiments to be conducted starting on October 1, 2017.

## **Part VI – AWARD ADMINISTRATION INFORMATION**

### **A. AWARD NOTICES.**

#### **1. Notice of Selection.**

UR/LLE will notify applicants selected for award.

### **B. OMEGA OPERATIONS REQUIREMENTS.**

#### **1. LFORM.**

Users of the UR/LLE facilities are expected to comply with the UR/LLE laboratory policies and procedures as identified in the OMEGA Laboratory Facility Organization and Regulation Manual: <http://www.lle.rochester.edu/media/resources/documents/3000.pdf>

## **PART VII – OMEGA FACILITY CONTACTS**

### **A. CONTACTS.**

Questions relating to the Laboratory Basic Science program and proposal submission procedures should be addressed to

John M Soures, NLUF Manager  
Telephone: (585) 275-3866  
FAX: (585) 256-2586  
e-mai: [jsou@lle.rochester.edu](mailto:jsou@lle.rochester.edu)

## **APPENDICES**

- A    Laboratory Basic Science Proposal Cover Page**
- B    Laboratory Basic Science Proposal Summary Sheet**
- C    Facility Experimental Configuration Summary**

**Appendix A – Cover Page**

**University of Rochester  
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**Laboratory Basic Science Experiments  
at the Omega Facility  
Fiscal Year 2018**

**Proposal Title:** \_\_\_\_\_  
\_\_\_\_\_

**Principal Investigator(s):** \_\_\_\_\_  
\_\_\_\_\_

**Telephone/e-mail:** \_\_\_\_\_

**Institutional Affiliation:** \_\_\_\_\_

**Address:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Submission Date:** \_\_\_\_\_

Appendix B

**OMEGA/OMEGA EP Laboratory Basic Science Proposal–2018  
Summary Sheet**

<b>Principal Investigator: (Name, Institution, Address)</b>	
<b>Title of Proposed Project:</b>	
<b>Proposed Project Objectives:</b>	
<b>Approach:</b>	
<b>Facility Requirements: (OMEGA/OMEGA EP, diagnostics, etc)</b>	
<b>Target Types:</b>	
<b>Number of Shots:</b>	
<b>Diagnostic Development Required:</b>	
<b>Equipment Required:</b>	
<b>User Provided Equipment:</b>	

**APPENDIX C: FACILITY EXPERIMENTAL CONFIGURATION SUMMARY–FY2018**

**Proposed Experiment Title** \_\_\_\_\_

**Principal Investigator:** \_\_\_\_\_ **Laboratory:** \_\_\_\_\_

**Facility Required:**  OMEGA 60 Beam  OMEGA EP  Joint (OMEGA/OMEGA EP)

**Target Requirements:**

If hohlraum  or half-hohlraum  specify:

Axis: \_\_\_\_\_

Scale size: \_\_\_\_\_

Material and thickness: \_\_\_\_\_

If spherical specify:

Diameter/thickness: \_\_\_\_\_

Materials: \_\_\_\_\_

Fill gas: \_\_\_\_\_

If other target, please describe: \_\_\_\_\_

**Target Fabrication:**

Total number: \_\_\_\_\_

Standard target:  Yes  No

Targets supplied by: \_\_\_\_\_

Hazardous materials: \_\_\_\_\_

**Laser Configuration:**

**OMEGA Drive:**

Pulse shape: \_\_\_\_\_ (If new, the design must be received by LLE two months in advance of planned shots):

Beams: \_\_\_\_\_

Energy (per beam, power setting, or kJ on target): \_\_\_\_\_

DPP's: \_\_\_\_\_

OMEGA driver: \_\_\_\_\_

**OMEGA Backlighter:**

Pulse shape: \_\_\_\_\_ Energy: \_\_\_\_\_ Drivers: \_\_\_\_\_

Beams: \_\_\_\_\_

DPP's: \_\_\_\_\_

Target positioner: \_\_\_\_\_

**OMEGA EP:**

Beam	Circle	Requested Configuration	Pulse Width	Energy (J)
1	UV	IR Short Pulse Sidelighter	_____	_____
2	UV	IR Short Pulse Backlighter	_____	_____
3	UV	_____	_____	_____
4	UV	_____	_____	_____



**Primary Diagnostic Configuration:**

TIM based: \_\_\_\_\_

Fixed: \_\_\_\_\_

New (please describe): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_