The Fourth Omega Laser Facility Users' Group Workshop

Introduction

A capacity gathering of 115 researchers from over 25 universities and laboratories and 9 countries met at the Laboratory for Laser Energetics (LLE) for the Fourth Omega Laser Facility Users' Group (OLUG) Workshop. The purpose of the 2.5-day workshop was to facilitate communications and exchanges among individual Omega users and between users and the LLE management; to present ongoing and proposed research; to encourage research opportunities and collaborations that could be undertaken at the Omega Laser Facility and in a complementary fashion at other facilities [such as the National Ignition Facility (NIF) or the Laboratoire pour l'Utilisation des Lasers Intenses (LULI)]; to provide an opportunity for students, postdoctoral fellows, and young researchers to present their research in an informal setting; and to provide feedback to LLE management from the users about ways to improve the facility and future experimental campaigns. The interactions were wide ranging and lively, as illustrated in the accompanying photographs.

OLUG consists of 304 members from 33 universities and 25 centers and national laboratories; their names and affiliations can be found at **www.lle.rochester.edu/media/about/documents/OLUGMEMBERS.pdf**. OLUG is by far the largest users' group in the world in the field of high-energy-density (HED) physics and certainly one of the most active.

During the first two mornings of the workshop, seven science and facility talks were presented. The facility talks proved especially useful for those not familiar with the art and complexities of performing experiments at the Omega Laser Facility. But since the facility is constantly changing and improving, even experienced users significantly benefited from these updates. The overview science talks, given by leading world authorities, described the breadth and excitement of HED science undertaken at the Omega Laser Facility.

Approximately 50 students and postdoctoral fellows participated in the workshop; 42 of these participants were supported

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Figure 132.29
A capacity gathering of 115 researchers from 25 universities and laboratories around the world participated in this year's workshop. OLUG has 304 members who come from 33 universities and 25 laboratories, making it by far the largest users' group in the world in high-energy-density physics. The next annual OLUG Workshop will occur on 24–26 April 2013.

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Figure 132.30
Nearly all of the 50 students and postdoctoral fellows who attended made poster presentations; 42 of these attendees received travel assistance from an NNSA grant. Travel assistance has already been arranged for the 2013 workshop. The workshop places tremendous emphasis on the participation and involvement of young researchers.

by travel grants from the National Nuclear Security Administration (NNSA). The content of their presentations ranged from target fabrication to simulating aspects of supernovae; the presentations generated spirited discussions, probing questions, and friendly suggestions. In total, there were 75 contributed posters, including 11 that focused on the Omega Facility. The invited and facility presentations, as well as OLUG's Findings and Recommendations, can be found at **www.lle.rochester.edu/about/omega_laser_users_group.php**.

An important function of the workshop was to develop a set of findings and recommendations to help set future priorities for the Omega Laser Facility. These findings were grouped into four areas: 60-beam OMEGA, OMEGA EP, general facility improvements, and accessibility of OMEGA operational information. These categories comprise a report to be given to the Omega Facility management. Twenty presentations were made by researchers deeply involved in HED science. LLE management uses these recommendations as a guide for making decisions about Omega Laser Facility operations, priorities, and future changes. In addition, the status of these OLUG findings and recommendations were updated and reviewed at a satellite evening meeting during the 2012 APS–DPP Conference. They will also form the grist for the forthcoming workshop.

One highlight of the workshop, as in past workshops, was a panel of students and postdoctoral fellows who discussed their experiences at the Omega Laser Facility and their thoughts and recommendations on facility improvements. The engaging discussions that were sparked by this forum resulted in student/postdoctoral recommendations for the facility.

Another important event at the end of the workshop was a panel of experts who gave an overview of the HED opportunities at national laboratories, universities, and LLE itself. These discussions are very useful for young researchers who may not know all the capabilities and HED research occurring at these different institutions.

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Figure 132.31
Registration for OLUG 2012 was a busy time. MIT's seven Ph.D. students worked the registration desk, demonstrating that they are capable of doing more than just physics!

Finally, one of the important decisions made at the workshop was the selection of 24–26 April 2013 as the date of the next users' workshop. Plans are already well underway for this event.

The photographs on the following pages provide a representative sampling of the workshop's talks, interactions, and ambience.


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Figure 132.32
University of Rochester Provost Ralph Kuncl (above), along with LLE Director Dr. Robert L. McCrory (not shown), welcomed and thanked the OLUG members for their active involvement in helping to guide and formulate the priorities and activities of the Omega Laser Facility.

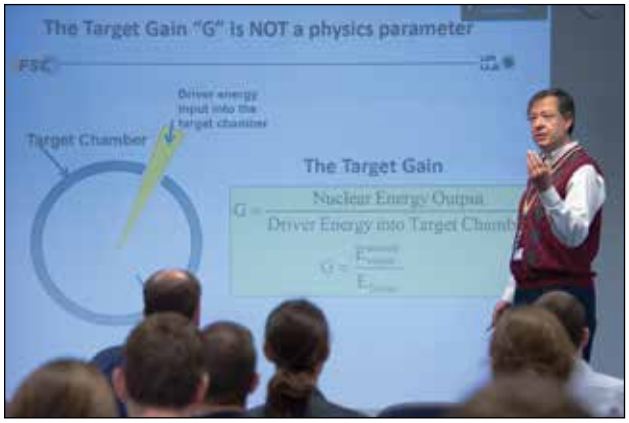

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Figure 132.33
Invited presentations of OLUG 2012 were made by world-class physicists, such as LLE's Riccardo Betti, who talked about frontier research in inertial confinement fusion (ICF) and, more generally, in HED physics.


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Figure 132.34
General Atomics' Joe Kilkenny, head of NIF diagnostics, presented many examples of the critical role that OMEGA and OLUG play in developing and fielding essential NIF diagnostics and platforms.


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Figure 132.35
Nino Landen [Lawrence Livermore National Laboratory (LLNL)] presented two talks: one highlighting the National Ignition Campaign's (NIC's) scientific progress and challenges; the other regarding the HED opportunities available at the Jupiter facility, in which a wider but smaller-scale spectrum of research was described.

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Figure 132.36
Hans Herrmann also presented two talks: one on gamma-ray spectroscopy at the Omega Laser Facility and the NIF; the other on the broader HED activities at Los Alamos National Laboratory. Hans is one of the leaders in the nascent field of plasma nuclear science.

U1466JR

Figure 132.37
During the workshop's numerous question and discussion sessions, animated and spirited discussions were the norm. Here LLNL postdoctoral fellow Nathan Kugland humorously (but seriously) raises a technical issue of widespread concern that impacts many OLUG members (i.e., imaging detectors for multi-MeV protons).

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Figure 132.38
During three different poster sessions, 75 posters were presented, the majority by students and postdoctoral fellows.

The 11 "Facility" posters (available online), many addressing findings and recommendations of OLUG, were widely lauded by the users. "Incredibly useful" was the universal sentiment for this session.

Another critical finding and recommendation of OLUG was the appointment of a key technical contact with whom the users can interact to help implement their complex experiments.

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Figure 132.39
Chuck Sorce, shown here talking with Carolyn Kuranz of the University of Michigan, was subsequently appointed head of the Experimental Support Group with a staff to address this issue. OLUG thanks LLE for such responsiveness.


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Figure 132.40
The student/postdoc panel and town meeting is one of OLUG's most important sessions, highlighting many of the challenges faced by young researchers at the Omega Laser Facility and elsewhere. Their findings and recommendations often highlight infrastructure and operational issues, many of which have been addressed by LLE.


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Figure 132.42
Princeton Physics Laboratory's Ken Hill presented, in a Findings and Recommendations session, a unique concept and proposal for an OMEGA high-resolution x-ray imaging spectrometer. OLUG recommends that we actively pursue further exploration and development of Dr. Hill's promising concept.


U1470JR

Figure 132.41
Rutherford-Appleton Laboratory's Peter Norreys chaired a session on findings and recommendations. Here he shares a light moment during Tammy Ma's presentation on the student/postdoc findings and recommendations. Tammy, a LLNL postdoctoral fellow, chairs that group.


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Figure 132.43
One of OLUG's 2011 Findings and Recommendations focused on the development of a robust magnetized HEDLP platform. LLE's Gennady Fiksel (right) and Professor Peter Norreys of Rutherford Appleton Laboratory (left) talked about these recent implementations, which OLUG found truly impressive! Thank you, LLE and Gennady!


U1473JR

Figure 132.44
In a session chaired by University of Nevada's Roberto Mancini (left), DOE technical manager Lois Buitano praised the OLUG/LLE working relationship: "This is an excellent model" for all NNSA facilities.

Questions Addressed in the General Workshop Sessions

What new avenues of research should we be pursuing at the Omega Laser Facility?

What facility improvements, large or small, can improve current research and help us pursue science at the cutting edge?

How can the administrative organization and the infrastructure at LLE better support ongoing and groundbreaking research?

What additional platforms/experiments/diagnostics might advantageously be built and coordinated, e.g., between OMEGA and the NIF, and/or between OMEGA and Trident or Jupiter?

The next Omega Laser Users' Group Workshop will be held at LLE on 24–26 April 2013.

ACKNOWLEDGMENT

This Omega Laser Facility Users' Workshop is made possible in part by the generous support of the National Nuclear Security Administration for travel expenses of students and postdoctoral fellows; by the Office of Fusion Energy Sciences for support of general workshop costs; by the Fusion Science Center; by the MIT/Plasma Science and Fusion Center; and by the Laboratory for Laser Energetics for the use and availability of critical resources and support. In addition, OLUG especially thanks LLE Director Dr. Robert L. McCrory and the LLE management and technical staff for their responsiveness to OLUG's findings and recommendations and for providing a superb and dynamic HED facility in which to conduct state-of-the-art experiments. For capturing through his lens the workshop ambiance, OLUG thanks Eugene Kowaluk. R. D. Petrasso is the editor for this Proceeding.


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Figure 132.45
The banquet at the Meliora on the University of Rochester's campus offered workshop attendees a wonderful opportunity for socializing and good cuisine.