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## Special Workshop Edition

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## Introduction

**For more information:** Visit the [workshop website](#) to download presentations, related submissions, the workshop survey results, and see who attended. (Past workshop web sites are also available from the [EFCOG website](#))

The 12th Department of Energy (DOE) Laser Safety Officer (LSO) Workshop was held at the University of Rochester/Laboratory for Laser Energetics (LLE) May 8-10, 2018. This Special Edition is devoted to recapping the activities of that event.

## 12th DOE LSO Workshop

The LLE at the University of Rochester, NY volunteered to host the 2018 Workshop with just 9 months to prepare. This was LLE's first involvement with the Laser Safety Task Group (LSTG) AND they had never attended a DOE LSO Workshop before. The Technical Planning Committee (TPC) included:

- Doug Jacobs-Perkins, LLE (chair)
- Karen Cera, LLE
- Tedi Criscuolo, PNNL
- Joseph M Greco, Upstate Medical Physics
- Jamie King, LLNL
- Eugene Kowaluk, LLE
- Barbara O'Kane, Colorado School of Mines
- Jason Puth, LLE
- Matt Quinn, FNAL

The TPC held bi-weekly teleconferences to draft an informative and flowing agenda, and formally an-

nounced the workshop on September 12th. With the agenda sessions laid out, next was the task of finding talks and presenters to fill them. Calls were made and favors returned. Surprisingly, the speaking spots filled up quickly and without effort.

Priding ourselves on providing the "best bang for the buck," early-bird registration was set at \$150, \$200 thereafter. LLE's Karen Cera worked tirelessly to keep us well within budget.

Many people worked behind the scenes to make this event happen. The final TPC meeting was held just a week out from the workshop to tie up the



Dr. Doug Jacobs Perkins (chair) welcomes attendees

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loose ends. Registration at the event went effortlessly with badges and commemorative water bottles being provided. The auditorium quickly filled up and the workshop chair, Doug Jacobs Perkins welcomed the audience. Providing the keynote, *Introduction to*

the first coffee break. With just one major laser safety meeting each year, this is the only time many get to see each other face-to-face, so it was difficult corralling them back into the auditorium.

Ken Barat, founder of the workshop in 2005, opened the "Laser Safety Fun-



LLE Associate Director Rip Collins give the keynote talk

*the Laboratory for Laser Energetics at the University of Rochester*, Dr. Gilbert 'Rip' Collins gave an informative and energized talk on LLE's research. The group would have to anxiously wait another day before they would be able to tour the laser facilities he discussed. After Q&A, it was time for

damentals" Session with *Resources for the LSO*. With approximately 75% of the audience being first-timers, his slides (reminder—most presentation materials can be downloaded from the website) will be referenced many times over.

Russ Garcia (University of Michigan)

presented *Laser Safety Implementation at the University of Michigan* and you could see eyes open wide as the audience related to the struggles of the laser safety officer. Tekla Staley (INL) gave one of the DOE presentations, *Follow-Up Benchmark Study of ANSI Z136.1 (2014) Controls Requirements*. This talk covered some of the extensive work that the LSTG does to help homogenize and simplify laser safety controls across the DOE complex.

A panel session, *Keeping it Simple, Laser Eyewear Use and Control*, provided an opportunity for open discussion with experts from industry, academia, and government.

The afternoon kicked off with the jam packed "Laser Safety Tool Box" Session. From Kyle Kafka (LLE) giving us an *Introduction to Optics* to Deanna Luke and Alex Lindquist (NREL) presenting their *Hands-on Laser Beam Path Alignment Practical Course/Control Considerations for Safe Laser Alignment to (Nearly) Painless Laboratory Audits* by Jennifer Goodnight (Howard Hughes Medical Institute) and DeWayne Holcomb's (UT at Austin) lively *The Appendix B—Getting Your Calc On*. There was something



for everyone. Jennifer gave a refreshing take on the way safety is approached at her facility and DeWayne actually made calculations “not boring.” How did that happen?

Three technical talks made up the last session of the day “Laser Eyewear.” Josh Hadler presented a follow up to studies that NIST has been doing in *Femtosecond Testing on Vendor Eyewear Results* followed by Michael Thomas (Spica Technologies) with *Characterization of Laser Eyewear Using Varying Pulse Conditions and Wavelengths*. The last talk of the day was by Major Edward Kelly (USAF) *Summary of Laser Eye Protection (LEP) Degradation Assessments*. These three talks made you think seriously about the last line of protection—laser eyewear.

In the evening, Ken Barat organized a “Petawatt LSO Working Group.” I am not sure if the free pizza or interest in the topic brought so many to the session, but we were treated to presentations on the *Laser Safety Program* and *Laser Interlock Systems* at ELI-NP by Radu-Costin Secareanu and Bertrand de Boisdeffre. After these presentations, participants decided to form a group to continue collaboration



Dave Canning, LLE's EP Laser Facility manager describes the OMEGA EP laser

among safety professionals at high intensity petawatt facilities. All of this was just in the first day!

The second day we dove right into it with a session on “Things to Think About.” Scott Snell (Porex) gave a talk on an often ignored subject by LSOs in *Laser Generated Air Contaminates, Why Should I Care?*.

Niel Leon and Scott Wohlstein teamed a presentation that is still blowing the audience's mind, *Virtual Laser Safety Experiment Design- Now is the Time*. The first session of the morning was rounded out with Matt Quinn (FNAL) presenting the DOE's

*2018 Laser Worker Survey Results*. Results were similar to the 2016 Laser Worker Survey, except this time questions were asked about the topic of “peeking.” This is where the laser worker looks over or under their eyewear while a laser on. An astonishing 10% of the DOE population reported that they had peeked in the past year. Additional probing is definitely needed for solutions to correct this unsafe practice.

The next session, “High-Powered/High Intensity Lasers” came with a twist. Rather than focus on some of the big facilities out there, focus was

## Workshop Survey Results

Approximately 75% of the attendees reported that this was their **FIRST** workshop

### TOP 10 OUTSTANDING-TALKS:

Safety Aspects of Laser Guide Star Operations in Astronomy

Recent Incidents and Lessons Learned at DOE Labs Since 2016

Femtosecond Testing on Vendor Eyewear Results

OMEGA Facility- Overview and Laser Safety Operations

Laser Science and Technology at LLE

Appendix B- Getting Your Calc On

Assessment of Non-Coherent Light Sources

Laser Generated Air Contaminants, Why Should I Care

(Nearly) Painless Laboratory Audits

Ultrashort Pulse OD Measurements using 200fs Laser

I want to personally thank all of those who participated in committees, session chairs, vendors, and those presenting talks. Having attended all but one workshop, I have seen this workshop mature into a top-notch event, on par with any other out there. Special thanks go to Doug, Eugene, Karen and all of the LLE staff that made this event so successful, and showcased their incredible facility.





on what should be done when dealing with lasers such as this. Randy Paura (Dynamic Laser Solutions, Inc.) presented *When an FMEA/Risk Assessment is required*. Randy emphasized that Class 4 lasers are not all the same. Mike Woods described how this method was applied in *Risk Assessment and Control Measures for a High Power OPCPA Laser Facility at SLAC*. Jake Bromage (LLE) closed out the session with *Laser Science and Technology at LLE*.

After lunch, Jason Puth (LLE) presented *OMEGA Facility - Overview and Laser Safety Operations* which was followed by the group photo, tours, and a vendor exhibit. This year there was a special treat with a hands-on optical breadboard demonstration by Kyle Kafka and Tyler Critelli (LLE) which drew a large audience and rave reviews. Kentek even had their mobile display (Photon 1) in the parking lot.

The evening brought the always anticipated Vendor Appreciation Dinner. This year's was held at the scenic Jetty on the Port restaurant, located at the mouth

of the Genesee River and shore of Lake Ontario. This was a great time to socialize, make connections and friendships, and enjoy perfect spring weather in Rochester (it had snowed just two weeks earlier!).

Thursday's first session "Emerging Technologies and Other Uses/Issues" started with the #1 voted most interesting talk of the workshop, *Safety Aspects of Laser Guide Star Operations in Astronomy* by Gustavo Rahmer (Large Binocular Telescope Observatory). Mr. Rahmer was energetic, entertaining, and informative. A true formula for success!

Next up was our friend from across the pond, David Eagan (AWE) with *Assessment of non-coherent light sources*. As non-coherent sources become more prevalent along with higher output power and diverse wavelengths, they present new challenges to a laser safety officer. I presented *Recent Incidents and Lessons Learned at DOE Labs Since 2016*. It is very important to share accidents and near misses so we can learn to improve our programs and let our laser folks understand why we implement the controls that we do.

The last session "Looking Back/Looking Ahead," started out with David Sliney (Johns Hopkins University) speaking on *The LSO and the Evolution of its Role over 45 Years*. It is always fascinating to hear about the history of laser safety and its evolution and Dr. Sliney has been around to see it all. Nat Quick (LIA) talked on *LIA Celebrating 50 Years and Advancing into the Future through Laser Industrial Applications and Safety*. Bill Ertle (RLI) rounded out the session with *Developments in Laser Safety Standards*. It is always important to let safety professionals know how standards are evolving, and encourage participation on the committees and become part of the solution. As this session ended early, we had time for a late entrant Jim Webb (Lasernet) to share *What is the practical value of good laser safety software?*. This talk presented the importance and practicality of good software and was the other side of DeWayne Holcomb's *Getting Your Calc On* talk from day 1.



After the workshop officially concluded, the EFCOG LSTG held their annual meeting while the University LSOs met. Friday morning the ANSI SSC-9 Manufacturing, and TSC-4 Control Measures and Training met. I can't forget to mention that the Board of Laser Safety offered the Certified Laser Safety Officer exam; two new CLSOs, Phillip Broughton and Valerie Perez, deserve our congratulations!

Overall it was a fantastic event again this year. First time attendee Christopher Wathen gave his recap of the workshop. "As a first-time attendee of the workshop, I found it to be focused and concise, with each presentation tailored to the interests and needs of the audience. Moreover, I was impressed with its ability to bring such a diverse group of people together for a common purpose: laser safety. The opportunity to share various perspectives and methods is sure to benefit me as I develop my understanding and appreciation of laser safety. The workshop, in my view, was a great success – and I look forward to attending again." We are already planning for the 2020 workshop and hope to lock in a host facility soon.

Don't forget that the International Laser Safety Conference is the next big event coming up in 2019 [link](#). I will be co-chairing the Technical Practical Applications Seminar again with my colleague, Eddie Ciprazo from UC Berkeley. If you have interest in presenting, please drop me an email and we can discuss.

The program would not have flowed so smoothly had it not been for our great Session Chairs. Thank you to Doug Jacobs-Perkins, Barb O'Kane, Judi Reilly, Eugene Kowaluk, Joe Greco, Tom Lieb, Karen Cera, Jay Larson, and Matt Quinn.

Thank you Eugene Kowaluk for all of the great photos. Remember, if you don't record or document it, it never happened.

Finally, a special thanks to all of our Attendees, Speakers, and Vendors who have continued to support this event. See you in 2020, location TBD.

**BE SAFE! Jamie**