

E. Michael Campbell  
*Director*

## MEMORANDUM

22 March 2021

**TO:** LLE Faculty, Staff, Students**FROM:** E. Michael Campbell**SUBJECT:** LLE Organizational Changes

Thanks to all of your efforts and despite the challenges that we have and continue to face with the COVID pandemic, the Laboratory is doing very well. The research and innovation that we are doing in support of the Cooperative Agreement with NNSA continues to make progress, the soon to be released JASON report I believe will be supportive of the ICF program and laser direct drive, the partnerships with the NNSA laboratories and the ICF/HEDP community is the strongest that I have ever seen in my career, and we continue to successfully expand our sponsor base. In addition, our partnership and collaboration with the campus on both research and education continues to grow, and we have support for a new building financed by the University.

While the Laboratory is in a strong position today, it is important that we plan and organize for the future. The future will not come to us—we must make it. There are three opportunities critical to LLE's future that will require focus and organization if we are to successfully obtain and execute them. As we have discussed, they include the renewal and expansion of the NNSA Cooperative Agreement (CA), the partnership with SLAC and LLNL on the Matter at Extreme Conditions (MEC) Upgrade funded by DOE Fusion Energy Sciences (FES), and the EP-OPAL project that would be funded by the National Science Foundation (NSF).

The present CA ends in FY23 and we must begin now to prepare for the FY24 to FY28 CA. The new CA needs to be funded at the levels that would enable us to continue to expand our capabilities in diagnostics, high-performance computing, exploit innovative concepts such as FLUX and develop 21<sup>st</sup> century probes for HEDP research. We must also obtain additional funds for sustaining the Omega facilities for the next decade (NIF and Z have developed plans and funding needs for this already) and it is not yet clear whether the CA or another funding vehicle is appropriate. *I believe that the research that we do during this next CA will lay the groundwork for a replacement for OMEGA-60 in the following decade.*

To achieve this goal, a compelling proposal, supported by NNSA, the NNSA laboratories, and the broader HEDP community is required. Such a task will require focus and participation by all of LLE. To lead this effort, I have asked Craig to join me in the Director's Office to lead this initiative that is critical for our future and that exploits the advances we have made, with much of the credit to Craig, with the NNSA community. To replace Craig, I have asked Sean Regan to lead the Experimental Division. Sean's experience, expertise, and enthusiasm for ICF and HEDP will continue to build on the Experimental Division's excellent legacy capabilities that have occurred under Craig's leadership.

As is recognized by the broad community, LLE is a leader in laser-plasma interaction physics resulting from the advances we have made in theory, modeling, diagnostics, and experimental capabilities (such as TOP9). Exploiting these capabilities, EP-OPAL would expand the research in this area and enable numerous new research opportunities in ultra-high-intensity plasma physics that such a world leading facility would provide.



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While we have not yet secured funding for EP-OPAL, significant progress in building the case for it following the National Academy of Sciences report, the Brightest Light Initiative (BLI) *and our interactions with NSF have significantly increased the prospects for success*. As evidence for this growing interest, our pre-proposal for the EP-OPAL Design activity (RI-1) has been selected for a full proposal to NSF. In order to increase the focus and visibility on plasma physics and to develop the science case for the EP-OPAL which will be critical for a successful proposal, we are forming a new multi-disciplinary division within LLE—the Plasma and Ultrafast Laser Science Division. I have asked Dustin Froula to lead this Division. In the months ahead, Dustin and Jon Zuegel will work together to prepare the proposal and to execute the research. There is much work to be done to eventually secure EP-OPAL and the formation of this Division is a critical step toward this goal.

The efforts of Jon Zuegel, Liz Hill, and our Laser and Materials Technology (LMT) Division have positioned LLE well as a partner with SLAC and LLNL in the MEC Upgrade (MEC-U) project at SLAC that would be funded by DOE Office of Fusion Energy Sciences. The MEC-U project completed Critical Decision Zero (CD-0) defining its mission need and it has scheduled CD-1 to approve a conceptual design in June of this year that will launch detailed design. DOE FES, Congress, and the HEDP community broadly support this multi-year project. LLE will build a kJ laser with temporally shaped nsec pulses for dynamic compression experiments in conjunction with the upgraded LCLS x-ray free electron laser (xFEL) at SLAC. Liz Hill will serve as the Project Manager for this effort and she will work closely with the LMT and Engineering divisions to execute the project successfully. This laser project, similar to what LLE successfully accomplished for the DCS laser at Argonne, will extend our relationship with DOE FES and prepare us for the construction of EP-OPAL. LLE remains committed to the completion and use of the FLUX laser (a highlight of the current CA) as a likely enabling technology for a replacement of OMEGA-60 in the next decade.

These new projects when funded will of course require new additions to LLE staff. There will also be movement of existing staff to the new Division. We will all work together to continue the excellent ongoing research at LLE while at the same time preparing for the future. It is important to understand that this organizational change is necessary to address future growth and opportunities. I am confident that this organizational change will be transparent with respect to other cooperative agreement and grant deliverables and will give us the strongest possible foundation for our next CA and a future new facility in EP-OPAL.

These changes are effective immediately.

