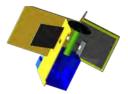
# SALLEE R. KLEIN

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### INTRODUCTION

I am head of target fabrication at the University of Michigan with the Center for Laser Experimental Astrophysical Research (CLEAR) group. I manage the entire life cycle of all campaigns, working very closely with faculty physicists, graduate students and managing numerous undergrads to achieve the highest level of success in high-energy-density physics (HEDP) campaigns routinely shot on high powered laser facilities around the United States.

# EDUCATION

B.S., *Physics* University of California, San Diego

### PROFESSIONAL EXPERIENCE

### Center for Laser Experimental Astrophysical Research (CLEAR)

Engineer in Research (November 2010 - Present)

- managing all HEDP target campaigns for CLEAR group
  - interface closely with physicist and graduate students to design repeatable targets, within the time and scope of individual campaigns
  - create 3D CAD models of target design
  - provide drawings to machinist, General Atomics (GA), laser machinist and specialty component vendors
  - material sourcing, including working with other facilities and vendors to obtain rare or custom components
  - primary intermediary with other target fabrication facilities, such as GA, Los Alamos and Livermore National Laboratoris to acquire specialized components per experimental requirements
  - interface closely with machinist to fabricate target components
  - precise assembly of targets by hand and with automation
  - generates detail documentation on build cycle, including components used with specifics on characterization results and timeline of build and subsequent metrology

- Shotday support at laser facility
  - transporting targets to laser facility along with any equipment needed on hand for possible repairs or shot day added components
  - target delivery on shot day
  - gas-fill with our portable fill system, including complying with all facility compressed gas safety regulations
  - any repairs or modifications to targets on demand through shot day under tight time constraints between shots cycles as short as 45 minutes
  - provide proper filtration for diagnostics, Ross Pairs and the stack configuration for the Static Pinhole Camera Array (SPCA)
  - communicate with laser facility personal disseminating pertinent information for modifications of experimental cofigurations
- on-site support of imaging X-ray Thomson scattering (iXTS) diagnostic at Laboratory for Laser Energetics (LLE), designed jointly by LANL and University of Michigan
  - preform pre-shot procedures on diagnostic
  - stack blast shield configuration
  - shot day modifications to blast shield configuration
- headed iXTS redesign project to allow for an option to use image plates (IP) instead of the current CCD camera configuration
  - all CAD modeling, drawings and coordination with our facility machinist for the redesign of iXTS diagnostic to accommodate IPs
  - worked in conjunction with University of Michigan and LANL machinists to modify existing iXTS hardware and to create additional hardware accommodating IPs
  - iXTS IP modification configuration was successfully fielded on Trident
  - interfacing with LLE mechanical engineers and diagnostic staff to pass facility design reviews, successfully implementing a redesign that will be fielded on a joint shot day with target in Omega and backlighter beams coming from Omega-EP August 2015
- develop techniques to improve target quality, including repeatability
  - design fabrication methods within CLEAR budget constraints
  - upgraded staging equipment for automated target fabrication when needed and metrology
  - design acrylic structures that ensure accurate, repeatable targets
  - design and implementation of simple jigs to ease target builds, saving time during construction

- create presentation quality visual media to showcase our target fabrication abilities
  - compiles high quality photographs used as advertisement of sophistication in target design and build techniques
  - represents our group at conferences and meetings with other labs and groups within the HEDP community
- manage several supporting laboratory projects carried out by undergraduates
  - 24 undergraduates work in one of two labs on seven projects
  - foam characterization
  - density characterization
  - thin film coater
  - film characterization
  - target fabrication x-ray source
  - target fabrication upgrade
  - crystal calibration

## PUBLICATIONS

#### First Author

"Novel Target Fabrication Using 3D Printing Developed at University of Michigan" Institute of Physics IOP Conference Series, expected publication date: March/April 2015

"Construction of a solenoid used on a magnetized plasma experiment" *Review of Scientific Instruments*, November 1, 2014, (Vol. 85, Issue 11, Pages 11E812)

"Innovations in Target Fabrication Techniques at the University of Michigan" Fusion Science and Technology, Mar./Apr. 2013, (Vol. 63)

#### <u>Co-author</u>

"Measurements of the energy spectrum of electrons emanating from solid materials irradiated by a picosecond laser" *Physics of Plasmas*, April 1, 2015, (Vol. 22, Issue 4, Pages 043113)

"Richtmyer-Meshkov evolution under steady shock conditions in the high-energy-density regime" *Applied Physics Letters*, March 16, 2015, (Vol. 106, Issue 11, Pages 114103)

"Preliminary characterization of a laser-generated plasma sheet" *High Energy Density Physics*, December 10, 2014

"Investigation of the hard x-ray background in backlit pinhole imagers" *Review of Scientific Instruments*, November 1, 2014, (Vol. 85, Issue 11, Pages 11E610)

"Demonstration of x-ray fluorescence imaging of a high-energy-density plasma" Review of Scientific Instruments, November 1, 2014, (Vol. 85, Issue 11, Pages 11E602)

"Experimental results from magnetized-jet experiments executed at the Jupiter Laser Facility" High Energy Density Physics, August 20, 2014

"Observation and modeling of mixing-layer development in high-energy-density, blast-wavedriven shear flow" *Physics of Plasmas*, May 1, 2014, (Vol. 21, Issue 5, Pages 056306)

"An experimental concept to measure opacities under solar-relevant conditions" High Energy Density Physics, June 2013

"Early-time evolution of a radiative shock" *High Energy Density Physics*, June 30, 2013, (Vol. 9, Issue 2, Pages 315-318)

"Radiative reverse shock laser experiments relevant to accretion processes in cataclysmic variables" *Physics Of Plasmas*, May 2013, (Vol. 20)

"Reverse Radiative Shock Laser Experiments Relevant To Accreting Stream-Disk Impact In Interacting Binaries" The Astrophysical Journal, January 2013, (Vol. 762, Number 1)

"Late-time breakup of laser-driven hydrodynamics experiments" *High Energy Density Physics*, December 31, 2012, (Vol. 8, Issue 4, Pages 360-365)

"Memristive Adaptive Filters" Applied Physics Letters, September 2010, (Vol. 97, Issue 9)

"Parameter and State Estimation of Experimental Chaotic Systems Using Synchronization" *Physical Review E*, July 2009, (Vol. 80, Issue 1)

#### CONFERENCES

56th Annual Meeting of the APS Division of Plasma Physics - Poster "Integrating 3D Printing into Target Fabrication at the University of Michigan" (November 2014)

5th Annual Target Fabrication Workshop - Poster "Novel Target Fabrication Using 3D Printing Developed at University of Michigan" (July 2014)

20th Topical Conference on High-Temperature Plasma Diagnostics - Poster "Construction of a solenoid used on a magnetized plasma experiment" (June 2014)

55th Annual Meeting of the APS Division of Plasma Physics - Presented Poster "3D Printing Utilized In Target Fabrication" (November 2013)

20th Target Fabrication Conference **Oral Presentation** "Innovations in Target Fabrication Techniques at the University of Michigan" (May 2013)

54th Annual Meeting of the APS Division of Plasma Physics - Presented Poster "Improving Target Repeatability Yields Broader Results in Component Fabrication and Overall Build" (November, 2012)

### PROFICIENCIES

- AutoCAD Inventor
- $IAT_EX$  documentation creation (including BEAMER)
- Power Point
- $\bullet\,$  MATLAB, including read-in of Exel files, compiling to output in a LATEX document complete with calculations

## VOLUNTEER

Young Physicist Program (YPP) Lab Instructor	January 2010
• setting up and running a teaching lab for young students	
• teaching circuit assembly and soldering	
Tech Trek	
<u>Lab Instructor</u>	Summer 2007, 2008, 2009
• setting up and running a teaching lab for young science minded female students	
• teaching circuit assembly and soldering	
• projects with liquid nitrogen	
Reach For Tomorrow Lab Instructor	Summer 2007, 2008, 2009
• setting up and running a teaching lab for young, underprivileged students	
• teaching circuit assembly and soldering	
• projects with liquid nitrogen	