Franklin J Dollar, PhD

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EMPLOYMENT

(2012 - Present) Research Associate, Kapteyn-Murnane group, JILA, University of Colorado, Boulder.

EDUCATION

Bach. Sci. Engineering Physics, University of California, Berkeley, (2006).
Mast. Sci. Eng. Electrical Engineering (*Optics Cognate*), University of Michigan, Ann Arbor, (2010).
Grad. Cert. Plasma Science & Engineering, University of Michigan, Ann Arbor, (2011).
Ph.D. Applied Physics (*Thesis Advisor: Prof. Karl Krushelnick*), University of Michigan, Ann Arbor, (2012).
Thesis title: *High intensity, high contrast laser solid interactions with short pulses*

HONORS & ACHIEVEMENTS

Rackham Merit Fellow, (University of Michigan, All Departments, 2007).
Alfred P. Sloan Minority PhD Scholar, (Nationally, 2008).
National Science Foundation Graduate Research Fellow, (Nationally, 2009).
American Indian Graduate Center Fellow, (Nationally, 2011).
Proquest Distinguished Dissertation Award Honorable Mention (University of Michigan, All Departments, 2012).
John Dawson Thesis Prize (Worldwide, 2013).

LABORATORY SKILLS

Design and use of particle diagnostics, such as magnetic spectrometers, Thomson parabola spectrometers, track detectors, and neutron time-of-flight detectors. Use of x-ray and soft x-ray spectrometers. Ultrafast pulse characterization, as well as stretcher and compressor alignment and optical spectroscopy. High intensity contrast improvement techniques. Target handling and fabrication, via microfabrication techniques. Ultrafast Ti:Sapphire and optical parametric amplifier laser system alignment and operation. Generation of high flux extreme ultraviolet light and "water window" x-rays via high-order harmonic generation.
Performed experiments with the following lasers:

- HERCULES Laser, Center for Ultrafast Optical Science (9 J, 30 fs), University of Michigan, Ann Arbor, MI, USA
- T-Cubed Laser, Center for Ultrafast Optical Science (10 J, 400 fs), University of Michigan, Ann Arbor, MI, USA
- Titan Laser, Jupiter Laser Facility (300 J, 1 ps), Lawrence Livermore National Laboratories, Livermore, CA, USA
- Red Dragon Laser (KM Labs 20mJ, 1Khz, 22 fs), JILA, University of Colorado, Boulder, CO, USA
- TOPAS-C Optical Parametric Amplifier (Light Conversion 1.3μm/2.1μm, 5mJ, 1KhZ, 60 fs), JILA, University of Colorado, Boulder, CO, USA

COMPUTATION SKILLS

Numerical simulations: OSIRIS 2.0 framework particle-in-cell code on the NYX/FLUX computing cluster at the University of Michigan, Ann Arbor, MI.
HYADES Radiation Hydrodynamics code.
Languages & Software: Matlab, IDL, ImageJ, LabView, C++, LaTeX.

PUBLICATION SUMMARY

Google Scholar 5 year h-index of 10.
Author or co-author of 20 refereed journal articles.
Author or co-author of 22 conference proceedings.
16 conference presentations (4 Invited oral, 6 contributed oral, 6 posters).

SELECTED PUBLICATIONS

1. M. C. Chen, et al., *Self-Isolating of Attosecond High-Order Harmonic Pulses Driven by a Multi-Cycle Mid-Infrared Laser*, Nat. Phot. (Submitted, 2014).
2. D. D. Hickstein, F. Dollar, et al., *Observation and control of shock waves in individual nanoplasmas*, Phys. Rev. Lett. (In Review, 2014).
3. F. Dollar, et al., *High-Intensity Laser-Driven Proton Acceleration Enhancement from Hydrogen Containing Ultrathin Targets*, App. Phys. Lett. **103**, 141117 (2013).
4. A. Maksimchuk, et al., *Dominant deuteron acceleration with a high-intensity laser for isotope production and neutron generation*, App. Phys. Lett. **102**, 191117 (2013).
5. F. Dollar, et al., *High contrast ion acceleration at intensities exceeding* 10^{21} Wcm^{-2}, Phys. Plasm. **20**, 056703 (2013).
6. F. Dollar, et al., *Scaling high-order harmonic generation from laser-solid interactions to ultra-high intensity*, Phys. Rev. Lett. **110**, 175002 (2013).
7. C. Zulick, F. Dollar, et al., *Energetic Neutron Beams Generated from Femtosecond Laser Plasma Interactions*, App. Phys. Lett. **102**, 124101 (2013).
8. W. Schumaker, et al., *Ultrafast electron radiography of magnetic fields in high-intensity laser-solid interactions*, Phys. Rev. Lett. **110**, 015003 (2013).
9. F. Dollar, et al., *Finite spot effects on radiation pressure acceleration from intense high-contrast laser interactions with thin targets*, Phys. Rev. Lett., **108**, 175005 (2012).
10. S. Kneip, et al., *X-ray phase contrast imaging of biological specimens with femtosecond pulses of betatron radiation from a compact laser plasma wakefield*, App. Phys. Lett., **99**, 093701 (2011).
11. F. Dollar, et al., *Control of energy spread in proton and ion beams generated from high contrast laser interactions*, Phys. Rev. Lett., **107**, 065003 (2011).
12. S. Kneip, et al., *Bright spatially coherent table-top x-ray synchrotron*, Nat. Phys., **6**, 980 (2010).
13. T. Matsuoka, et al., *Stimulated Raman Side Scattering in Laser Wakefield Acceleration*, Phys. Rev. Lett., **105**, 034801 (2010).
14. C. McGuffey, et al., *Ionization Induced Trapping in a Laser Wakefield Accelerator*, Phys. Rev. Lett., **104**, 025004 (2010).
15. W. D. Ristenpart, J. C. Bird, A. Belmonte, F. Dollar, and H. A. Stone, *Non-coalescence of oppositely charged drops*, Nature, **461**, 7262 (2009).
16. A. L. Aquila, F. Salmassi, F. Dollar, Y. Liu, and E. M. Gullikson, *Developments in realistic design for aperiodic Mo/Si multilayer mirrors*, Opt. Exp., **14**, 21 (2006).