

Franklin Dollar

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Personal

Citizenship: United States of America

Tribal Affiliation: Dry Creek Band of Pomo Indians (Enrolled, Federally Recognized)

Research Interests: Ultrafast x-ray sources and applications. Experiments and numerical modeling of ultrafast laser plasma interactions; including light ion acceleration, electron acceleration, neutron generation, x-ray production, high-order harmonic generation, nanoplasmonics, shock physics, imaging, and high intensity absorption processes.

ORCID Number: 0000-0003-3346-5763

Employment

(2021-Present): Associate Dean of Graduate Studies, School of Physical Sciences, University of California, Irvine

(2019-Present): Associate Professor, Department of Physics & Astronomy, University of California, Irvine

(2015-2019): Assistant Professor, Department of Physics & Astronomy, University of California, Irvine

(2012-2015): Senior Research Associate/Research Associate, Kapteyn-Murnane group, JILA, University of Colorado, Boulder & National Institute of Standards and Technology

Education

University of Michigan **Ann Arbor**
Ph.D., Applied Physics 2012

Thesis Advisor: Prof. Karl Krushelnick

Thesis title: High intensity, high contrast laser solid interactions with short pulses

University of Michigan **Ann Arbor**
Grad. Cert., Plasma Science & Engineering 2011

University of Michigan **Ann Arbor**
M.S.E., Electrical Engineering 2010

Cognate: Optics

University of California **Berkeley**
B.S., Engineering Physics 2006

Honors & Achievements

- Kavli Fellow (Nationally, 2022)
- UCI Tom Angell Mentoring Faculty Fellowship Award (University of California, Irvine, 2021)
- UCI Physics & Astronomy Outstanding Contributions to Undergraduate Education (Departmental, 2018)
- National Science Foundation CAREER Award (Nationally, 2018)
- Nature Journals Outstanding Peer Reviewer (Internationally, 2017)
- IOP Outstanding Reviewer Award (Internationally, 2017)
- Alfred P. Sloan Research Fellow (Nationally, 2016)
- American Indian Science and Engineering Society Most Promising Scientist (Nationally, 2015)
- John Dawson Thesis Prize (Worldwide, 2013)
- Proquest Distinguished Dissertation Award Honorable Mention (University of Michigan, 2012)
- American Indian Graduate Center Fellow (Nationally, 2011)
- National Science Foundation Graduate Research Fellow (Nationally, 2009)
- Alfred P. Sloan Minority PhD Scholar (Nationally, 2008)
- Rackham Merit Fellow (University of Michigan, All Departments, 2007)

Publication Summary

Google Scholar: >3,600 citations, h-index of 29, i10-index of 38

Peer Reviewed Journal Articles: 45 authored or co-authored

Conference Proceedings: 32 authored or co-authored

Invited Presentations: 13 oral talks

Research Grants

Nonlinear Plasma Compression for Ultraintense Relativistic Laser Science	\$550,000
<i>Department of Energy, Office of Science</i>	2022 - 2025
Support: 1 Mos. Summer	
Role: PI, <i>PI:</i> Franklin Dollar (Sole PI)	
Science & Technology Center	\$48,000,000
<i>National Science Foundation</i>	2017 - 2026
Support: 1 Mos. Summer	
Role: UCI Site Lead, <i>PI:</i> Margaret Murnane, University of Colorado, Boulder	
CAREER	\$840,000
<i>National Science Foundation</i>	2018 - 2023
Support: 1 Mos. Summer	
Role: PI, <i>PI:</i> Franklin Dollar (Sole PI)	
Governor's Office of Planning & Research	\$600,000
<i>State of California</i>	2020 - 2022
Support: 1 Mos. Summer	
Role: Co-PI, <i>PI:</i> Peter Taborek	

Synergistic Activities

Committee Member: Cal-Bridge Partnership and Mentoring Committee (2020 - 2022)

Secretary: LaserNetUS User Group Executive Committee, Department of Energy (2021 - Present)

Organizing Committee Member: Ecosystem for Collaborative Leadership and Inclusive innovation in Plasma Science and Engineering (ECLIPSE) Conference, National Science Foundation (2021-2022)

Committee Member: Assessment of High Energy Density (HED) Physics, National Academies of Science, Engineering, and Medicine, (2021)

Committee Member: Academic Planning Group (APG) work group on Reimagining Graduate Education, University of California, Irvine, (2021-2022)

Editorial Board Member: New Journal of Physics, Institute of Physics Publishing, (2021-Present)

Council Member: Academic Senate Council on Equity & Inclusion, University of California, Irvine, (2020-2021)

User Representative: Scientific Advisory Board, LaserNetUS, Department of Energy (2019 - Present)

Steering Committee Member: High Energy Density Science Association (2019 - Present)

Vice-chair: Inclusive Excellence, Department of Physics & Astronomy, UCI (2019 - 2021)

Faculty Representative: University of California Leadership and Excellence through Advanced Degrees steering committee, University of California Office of the President, (2016 - Present)

Committee Member: Inclusive Excellence, Mentoring (Co-Chair), Graduate Admissions, Graduate Qualifying Exam Policy, Department of Physics & Astronomy, UCI

Referee: Physical Review Letters, Nature Physics, J. Physics B: AMO Phys., Physics of Plasmas, Scientific Reports, Applied Sciences, Nature Photonics, New J. Physics, Physical Review Accelerators Beams

Grant Review Panelist: University of California Historically Black Colleges & Universities Initiative, University of California Office of the President (2018, 2021, 2022)

Grant Review Panelist: NSF Grant Review Panelist (2014, 2016, 2017, 2019, 2020)

Judge: University of California LEADS Statewide Symposium (2014, 2016 - 2021)

Judge: California Louis Stokes Alliance for Minority Participation (LSAMP) Statewide Symposium (2015 - 2019)

Guest Speaker: Native American Calling *Topic: Where Science and Culture Meet* (2013)

Professional Organizations

American Physical Society: Member (2004-present)

Optical Science of America: Member (2016 - present)

High Energy Density Science Association: Member (2011-present)

American Indian Science & Engineering Society: Sequoyah Fellow, (2003-present)

NIF/Jupiter Laser Facility User Group: Member (2011 - present)

Academic Instruction

Physics 7LC: Introduction to Mechanics Laboratory/Tutorials (2015, 2016)

Physics 7C: Introduction to Mechanics (Large Lecture) (2016, 2018)

Physics 7D: Introduction to Electricity & Magnetism (Large Lecture) (2021, 2022)

Physics 134A: Geometric & Physical Optics (2017, 2018, 2020)

Physics 239B: Plasma Physics Fluid Description (2017, 2018)

Student Supervision

Masters Students: Tam Nguyen, Yasmeen Musthafa.

Doctoral Students: Deano Farinella, Sahel Hakimi, Nick Beier, Alison Hunter, Matt Stanfield, Danny Attiyah, Chris Gardner, Victor Flores.

Undergraduate Researchers: Luc D' Hathuille, Cheyenne Nelson, Edgar Ibarra, Anass Malabeh, Keqin Cai, Henry Amir, Danny Attiyah, Tina Tran, Yasmeen Musthafa, Amanda Bell, Mahek Logantha, Alfredo Macias, Chance Ornellas-Skarin, Chris Gardner, Amanda Livingston, Lily Castellon, Mirella Soto, Yarin Heffes, David Dang, Sean Ricarte, Gynell Higby, Anjali Moore, Nathan Lee.

Advancement and Thesis committees: Yoonwoo Hwang, Calvin Lau, Elizabeth Heckmaier, Adam Hanninen, Dave Knez, Anneka Miller, Dave Knez, Jingyi Yang, Jordon Ott, Joseph Capani, Jr., Sudip Gurung, Haytham Effarah.

Refereed Journal Publications

48. N. F. Beier, H. Allison, P. Efthimion, K. Flippo, L. Gao, S. Hansen, K. Hill, R. Hollinger, M. Logantha, Y. Musthafa, R. Nedbailo, V. Senthilkumaran, R. Shepherd, V. N. Shlyaptsev, H. Song, S. Wang, F. Dollar, J. J. Rocca, and A. Hussein, *Homogeneous, micron-scale high energy density matter generated by relativistic laser-solid interactions*, (Accepted, Phys. Rev. Lett., 2022)
47. M. Stanfield, J. Ott, C. Gardner, N. F. Beier, D. Farinella, C. A. Mancuso, P. Baldi, and F. Dollar, *Real-time reconstruction of high energy, ultrafast laser pulses using deep learning*, Sci. Rep. **12**, 1-11 (2022). <https://doi.org/10.1038/s41598-022-09041-y>
46. Y. Ma, D. Seipt, A. E. Hussein, S. Hakimi, N. F. Beier, S. B. Hansen, J. Hinojosa, A. Maksimchuk, J. Nees, K. Krushelnick, A. G. R. Thomas, and F. Dollar, *The effects of laser polarization and wavelength on injection dynamics of a laser wakefield accelerator*, Phys. Plasm. **28**, 063101 (2021). <https://doi.org/10.1063/5.0051125>
45. M. Stanfield, D. Farinella, N. Beier, S. Hakimi, H. Allison, A. E. Hussein, T. Tajima, and F. Dollar, *Millijoule few-cycle pulses from staged compression for strong and high field science*, Opt. Exp. **29**, 9123-9136 (2021). <https://doi.org/10.1364/OE.417404>
44. Y. Ma, D. Seipt, A. E. Hussein, S. Hakimi, N. F. Beier, S. B. Hansen, J. Hinojosa, A. Maksimchuk, J. Nees, K. Krushelnick, A. G. R. Thomas, and F. Dollar, *Polarization-Dependent Self-Injection by*

Above Threshold Ionization Heating in a Laser Wakefield Accelerator, Phys. Rev. Lett. **124**, 114801 (2020). <https://doi.org/10.1103/PhysRevLett.124.114801>

43. S. Hakimi, X. Zhang, C. Lau, P. Taborek, F. Dollar and T. Tajima, *X-ray laser wakefield acceleration in a nanotube*, Inter. J. Mod. Phys. A **34**, 1943011 (2019). <https://doi.org/10.1142/S0217751X19430115>
42. D. M. Farinella, M. Stanfield, N. Beier, T. Nguyen, S. Hakimi, T. Tajima, F. Dollar, J. Wheeler and G. Mourou, *Demonstration of thin film compression for short-pulse X-ray generation*, Inter. J. Mod. Phys. A **34**, 1943015 (2019). <https://doi.org/10.1142/S0217751X19430152>
41. N. Beier, T. Nguyen, J. Lin, J. A. Nees, K. Krushelnick, and F. Dollar, *Relativistic short-pulse high harmonic generation at 1.3 and 2.1 micron wavelengths*, New J. Phys. **21**, 043052 (2019). <https://doi.org/10.1088/1367-2630/ab1823>
40. D. M. Farinella, J. Wheeler, A. E. Hussein, J. Nees, M. Stanfield, N. Beier, Y. Ma, G. Cojocaru, R. Ungureanu, M. Pittman, J. Demailly, E. Baynard, R. Fabbri, M. Masruri, R. Secareanu, A. Naziru, R. Dabu, A. Maksimchuk, K. Krushelnick, D. Ros, G. Mourou, T. Tajima, and F. Dollar, *Focusability of laser pulses at petawatt transport intensities in thin-film compression*, JOSA B (Supercontinuum Special Edition) **36**, A28 (2019). <https://doi.org/10.1364/JOSAB.36.000A28>
39. L. Willingale, A. V. Arefiev, G. J. Williams, C. Zulick, F. Dollar, A. U. Hazi, A. Maksimchuk, M. J.-E. Manuel, E. Marley, W. Nazarov, Z. Zhao, and H. Chen, *The Unexpected Role of Evolving Longitudinal Electric Fields in Generating Energetic Electrons in Relativistically Transparent Plasmas*, New J. Phys. **20**, 093024 (2018). <https://doi.org/10.1088/1367-2630/aae034>
38. C. McGuffey, W. Schumaker, T. Matsuoka, V. Chvykov, F. Dollar, G. Kalintchenko, S. Kneip, Z. Najmudin, S.P.D. Mangles, M. Vargas, V. Yanovsky, A. Maksimchuk, A. G. R. Thomas, and K. Krushelnick, *On the properties of synchrotron-like X-ray emission from laser wakefield accelerated electron beams*, Phys. Plasm. **25**, 043104 (2018). <https://doi.org/10.1063/1.5024547>
37. D. Popmintchev, B. R. Galloway, M.-C. Chen, F. Dollar, C. A. Mancuso, A. Hankla, L. Miaja-Avila, G. O'Neil, J. M. Shaw, G. Fan, S. Alisauskas, G. Andriukaitis, T. Balciunas, O. D. Mucke, A. Pugzlys, A. Baltuska, H. C. Kapteyn, T. Popmintchev, and M. M. Murnane, *Near- and Extended-Edge X-Ray-Absorption Fine-Structure Spectroscopy Using Ultrafast Coherent High-Order Harmonic Supercontinua*, Phys. Rev. Lett. **120** (Featured in Physics), 093002, (2018). <https://doi.org/10.1103/PhysRevLett.120.093002>
36. S. Hakimi, T. Nguyen, D. Farinella, C. K. Lau, H.-Y. Wang, P. Taborek, F. Dollar, and T. Tajima, *Wakefield in solid state plasma with the ionic lattice force*, Plasm. Phys. **25**, 023112 (2018). <https://doi.org/10.1063/1.5016445>
35. F. Dollar, C. Zulick, A. Raymond, V. Chvykov, L. Willingale, V. Yanovsky, A. Maksimchuk, A. G. R. Thomas, and K. Krushelnick, *Enhanced laser absorption from radiation pressure in intense laser plasma interactions*, New J. Phys. **19**, 063014 (2017). <https://doi.org/10.1088/1367-2630/aa6fe2>

34. J. L. Ellis, K. M. Dorney, C. G. Durfee, C. Hernández-García, F. Dollar, C. A. Mancuso, T. Fan, D. Zusin, C. Gentry, P. Grychtol, H. C. Kapteyn, M. M. Murnane, and D. D. Hickstein, *Phase matching of noncollinear sum and difference frequency high harmonic generation above and below the critical ionization level*, *Opt. Exp.* **25**, 10126 (2017). <https://doi.org/10.1364/OE.25.010126>
33. X. Zhang, T. Tajima, D. Farinella, Y. Shin, G. Mourou, J. Wheeler, P. Taborek, P. Chen, F. Dollar, and B. Shen, *Particle-in-cell simulation of x-ray wakefield acceleration and betatron radiation in nanotubes*, *Phys. Rev. Acc. Beams* **19**, 101004 (2016). <https://doi.org/10.1103/PhysRevAccelBeams.19.101004>
32. C. A. Mancuso, K. M. Dorney, D. D. Hickstein, J. L. Chaloupka, J. L. Ellis, F. J. Dollar, R. Knut, P. Grychtol, D. Zusin, C. Gentry, M. Gopalakrishnan, H. C. Kapteyn, and M. M. Murnane, *Controlling Nonsequential Double Ionization in Two-Color Circularly Polarized Femtosecond Laser Fields*, *Phys. Rev. Lett.* **117**, 133201 (2016). <https://doi.org/10.1103/PhysRevLett.117.133201>
31. C.A. Mancuso, D.D. Hickstein, K.M. Dorney, J.L. Ellis, E. Hasovic, R. Knut, P. Grychtol, C. Gentry, M. Gopalakrishnan, D. Zusin, F.J. Dollar, X.M. Tong, D.B. Milosevic, W. Becker, H.C. Kapteyn, and M.M Murnane *Controlling Electron-Ion Rescattering in Two-Color Circularly Polarized Femtosecond Laser Fields*, *Phys. Rev. A* **93**, 053406 (2016). <http://dx.doi.org/10.1103/PhysRevA.93.053406>
30. J. L. Ellis, D. D. Hickstein, W. Xiong, F. Dollar, B. Palm, K. E. Keister, K. M. Dorney, C. Ding, T. Fan, M. B. Wilker, K. J. Schnitzenbaumer, G. Dukovic, J. L. Jimenez, H. C. Kapteyn, and M. M. Murnane, *Materials properties and solvated electron dynamics of isolated nanoparticles probed with ultrafast extreme ultraviolet beams*, *Journ. Phys. Chem. Lett.* **7**, 609 - 615 (2015). <http://dx.doi.org/10.1021/acs.jpcllett.5b02772>
29. D. Popmintchev, C. Hernández-García, F. Dollar, C. Mancuso, J. A. Pérez-Hernández, M. C. Chen, A. Hankla, X. Gao, B. Shim, A. Gaeta, M. Tarazkar, D. A. Romanov, R. J. Levis, J. A. Gaffney, M. Foord, S. B. Libby, A. Becker, A. Jaroń-Becker, A. Becker, L. Plaja, M. M. Murnane, H. C. Kapteyn, and T. Popmintchev, *Ultraviolet surprise: Efficient soft x-ray high-harmonic generation in multiply ionized plasmas*, *Science* **350**, 1225-1231 (2015). <http://dx.doi.org/10.1126/science.aac9755>
28. T. Fan, P. Grychtol, R. Knut, C. Hernández-García, D. D. Hickstein, D. Zusin, C. Gentry, F. Dollar, C. Mancuso, C. W. Hogle, O. Kfir, D. Legut, K. Carva, J. L. Ellis, K. Dorney, C. Chen, O. G. Shpyrko, E. E. Fullerton, O. Cohen, P. Oppeneer, D. B. Milošević, A. Becker, A. A. Jaroń-Becker, T. Popmintchev, M. M. Murnane, and H. C. Kapteyn, *Bright circularly polarized soft X-ray high harmonics for X-ray magnetic circular dichroism*, *Proc. Nat. Acad. Sci.* **112**, 14206 (2015). <http://dx.doi.org/10.1073/pnas.1519666112>
27. D. D. Hickstein, F. Dollar, P. Grychtol, J. L. Ellis, R. Knut, C. Hernández-García, C. Gentry, D. Zusin, J. M. Shaw, T.T. Fan, K. M. Dorney, A. Becker, A. Jaroń-Becker, H. C. Kapteyn, M. M. Murnane, and C. G. Durfee, *Noncollinear generation of angularly isolated circularly polarized high harmonics*, *Nat. Phot.* **9**, 743 (2015). <http://dx.doi.org/10.1038/nphoton.2015.181>

26. E. Welch, P. Zhang, F. Dollar, K. Krushelnick, and A. G. R. Thomas, *Correcting Doppler shifts in High-Order Harmonic Generation in Intense Laser Interactions with Solid Density Plasma using Frequency Chirped Pulses*, *Phys. Plasm.* **22**, 053104 (2015). <http://dx.doi.org/10.1063/1.4919857>
25. C. Mancuso, D. D. Hickstein, P. Grychtol, O. Kfir, R. Knut, F. Dollar, X.-M. Tong, D. Zusin, M. Gopalakrishnan, C. Gentry, E. Turgut, J. L. Ellis, M.-C. Chen, A. Fleischer, O. Cohen, H. C. Kapteyn, and M. M. Murnane, *Photoelectron distributions from circularly polarized two-color femtosecond fields*, *Phys. Rev. A.* **91**, 033834 (2015). <http://dx.doi.org/10.1103/PhysRevA.91.031402>
24. D. D. Hickstein, F. Dollar, J. L. Ellis, K. J. Schnitzenbaumer, B. B. Palm, K. E. Keister, C. Ding, G. M. Petrov, J. A. Gaffney, M. E. Foord, S. B. Libby, G. Dukovic, J. L. Jimenez, H. C. Kapteyn, M. M. Murnane, and W. Xiong, *Mapping nanoscale absorption of intense laser light using plasma explosion imaging*, *ACS Nano* **8**, 8810 (2014). <http://dx.doi.org/10.1021/nn503199v>
23. T. Matsuoka, C. McGuffey, P. Cummings, S. S. Bulanov, V. Chvykov, F. Dollar, Y. Horovitz, G. Kalinchenko, K. Krushelnick, P. Rousseau, A. G. R. Thomas, V. Yanovsky, and A. Maksimchuk, *On Electron Betatron Motion and Electron Injection in Laser Wakefield Accelerators*, *Plasm. Phys. Con. Fus.* **56**, 084009 (2014). <http://dx.doi.org/10.1088/0741-3335/56/8/084009>
22. M.-C. Chen, C. Manusco, B. Galloway, P.-C. Huang, C. Hernández-García, F. Dollar, D. Popmintchev, T. Popmintchev, M. M. Murnane, and H. C. Kapteyn, *Self-Isolating of Attosecond High-Order Harmonic Pulses Driven by a Multi-Cycle Mid-Infrared Laser*, *Proc. Nat. Acad. Sci.* **111**, 8329 (2014). <http://dx.doi.org/10.1073/pnas.1407421111>
21. D. D. Hickstein, F. Dollar, J. Gaffney, M. Foord, G. Petrov, B. Palm, K. E. Keister, J. L. Ellis, C. Ding, S. Libby, J. Luis-Jimenez, H. C. Kapteyn, M. M. Murnane, and W. Xiong, *FOCUS: Observation and control of shock waves in individual nanoplasmas*, *Phys. Rev. Lett.* **112**, 115004 Physics Focus Article (2014). <http://dx.doi.org/10.1103/PhysRevLett.112.115004>
20. C. Zulick, B. Hou, F. Dollar, A. Maksimchuk, J. Nees, A. G. R. Thomas, Z. Zhao and K. Krushelnick, *High resolution Bremsstrahlung and fast electron characterization in ultrafast intense laser-solid interactions*, *New J. Phys.* **15**, 123038 (2013). <http://dx.doi.org/10.1088/1367-2630/15/12/123038>
19. F. Dollar, S. A. Reed, T. Matsuoka, S. S. Bulanov, V. Chvykov, G. Kalintchenko, C. McGuffey, P. Rousseau, A. G. R. Thomas, L. Willingale, V. Yanovsky, D. W. Litzenberg, K. Krushelnick, and A. Maksimchuk, *High-Intensity Laser-Driven Proton Acceleration Enhancement from Hydrogen Containing Ultrathin Targets*, *App. Phys. Lett.* **103**, 141117 (2013). <http://dx.doi.org/10.1063/1.4824361>
18. A. Maksimchuk, A. Raymond, F. Yu, G. M. Petrov, F. Dollar, L. Willingale, C. Zulick, J. Davis, and K. Krushelnick, *Dominant deuteron acceleration with a high-intensity laser for isotope production and neutron generation*, *App. Phys. Lett.* **102**, 191117 (2013). <http://dx.doi.org/10.1063/1.4807143>

17. F. Dollar, C. Zulick, T. Matsuoka, C. McGuffey, S. S. Bulanov, V. Chvykov, J. Davis, G. Kalintchenko, G. Petrov, L. Willingale, V. Yanovsky, A. Maksimchuk, A. G. R. Thomas, and K. Krushelnick, *High contrast ion acceleration at intensities exceeding $10^{21} \text{ W cm}^{-2}$* , Phys. Plasm. **20**, 056703 (2013). <http://dx.doi.org/10.1063/1.4803082>
16. F. Dollar, P. Cummings, V. Chvykov, M. Vargas, L. Willingale, V. Yanovsky, C. Zulick, A. Maksimchuk, A. G. R. Thomas, and K. Krushelnick, *Scaling high-order harmonic generation from laser-solid interactions to ultra-high intensity*, Phys. Rev. Lett. **110**, 175002 (2013). <http://dx.doi.org/10.1103/PhysRevLett.110.175002>
15. A. Brantov, V. Yu. Bychenkov, D. V. Romanov, F. Dollar, A. Maksimchuk, and K. Krushelnick, *High-Intensity Laser Triggered Proton Acceleration from Ultrathin Foils*, Contrib. Plasma Phys. **53**, 161-164 (2013). <http://dx.doi.org/10.1002/ctpp.201310028>
14. C. Zulick, F. Dollar, V. Chvykov, J. Davis, G. Kalintchenko, A. Maksimchuk, G. M. Petrov, A. Raymond, A. G. R. Thomas, L. Willingale, V. Yanovsky, and K. Krushelnick, *Energetic Neutron Beams Generated from Femtosecond Laser Plasma Interactions*, App. Phys. Lett. **102**, 124101 (2013). <http://dx.doi.org/10.1063/1.4795723>
13. W. Schumaker, N. Nakanii, C. McGuffey, C. Zulick, V. Chvykov, F. Dollar, H. Habara, G. Kalintchenko, A. Maksimchuk, K. A. Tanaka, A. G. R. Thomas, V. Yanovsky, and K. Krushelnick, *Ultrafast electron radiography of magnetic fields in high-intensity laser-solid interactions*, Phys. Rev. Lett. **110**, 015003 (2013). <http://dx.doi.org/10.1103/PhysRevLett.110.015003>
12. C. McGuffey, T. Matsuoka, S. Kneip, W. Schumaker, F. Dollar, C. Zulick, V. Chvykov, G. Kalintchenko, V. Yanovsky, A. Maksimchuk, A.G.R. Thomas, K. Krushelnick, and Z. Najmudin, *Experimental laser wakefield acceleration scalings exceeding 100 TW*, Phys. Plas. **19**, 063113 (2012). <http://dx.doi.org/10.1063/1.4729659>
11. F. Dollar, C. Zulick, A. G. R. Thomas, V. Chvykov, J. Davis, G. Kalintchenko, T. Matsuoka, C. McGuffey, G. Petrov, L. Willingale, V. Yanovsky, A. Maksimchuk, and K. Krushelnick, *Finite spot effects on radiation pressure acceleration from intense high-contrast laser interactions with thin targets*, Phys. Rev. Lett. **108**, 175005 (2012). <http://dx.doi.org/10.1103/PhysRevLett.108.175005>
10. S. Kneip, C. McGuffey, J. L. Martins, M. S. Bloom, V. Chvykov, F. Dollar, R. Fonseca, S. Jolly, G. Kalintchenko, K. Krushelnick, A. Maksimchuk, S. P. D. Mangles, Z. Najmudin, C. A. J. Palmer, K. Ta Phuoc, W. Schumaker, L. O. Silva, J. Vieira, V. Yanovsky, and A. G. R. Thomas, *Characterization of transverse beam emittance of electrons from a laser-plasma wakefield accelerator in the bubble regime using betatron x-ray radiation*, Phys. Rev. Spec. Top. Acc. Beams **15**, 021302 (2012). <http://dx.doi.org/10.1103/PhysRevSTAB.15.021302>
9. S. Kneip, C. McGuffey, F. Dollar, M. S. Bloom, V. Chvykov, G. Kalintchenko, K. Krushelnick, A. Maksimchuk, S. P. D. Mangles, T. Matsuoka, Z. Najmudin, C. A. J. Palmer, J. Schreiber, W. Schumaker, A. G. R. Thomas, and V. Yanovsky, *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). <http://dx.doi.org/10.1063/1.3627216>

8. [F. Dollar](#), T. Matsuoka, G. Petrov, A. G. R. Thomas, S. S. Bulanov, V. Chvykov, J. Davis, G. Kalinchenko, C. McGuffey, L. Willingale, V. Yanovsky, A. Maksimchuk, and K. Krushelnick, *Control of energy spread in proton and ion beams generated from high contrast laser interactions*, Phys. Rev. Lett. **107**, 065003 (2011). <http://dx.doi.org/10.1103/PhysRevLett.107.065003>
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