Louise Willingale MSci PhD DIC MInstP

Electrical Engineering and Computer Science Department
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Research Interests

Experiments and numerical modeling of ultra-high intensity laser plasma interactions:
Laser driven ion acceleration, proton deflectometry, laser channeling, laser propagation in the ultra-relativistic induced transparency regime, relativistic laser electron heating mechanisms including direct laser acceleration (DLA), laser-driven magnetic field generation, dynamics and reconnection

Education

1999 – 2003	MSci, Physics (1st Class Honours), Imperial College London
2003 – 2007	PhD, Plasma Physics, Imperial College London *Ion acceleration from high intensity laser plasma interactions: Measurements and applications* Supervised by Prof. Karl Krushelnick and Prof. Zulfikar Najmudin
2016 – 2017	PGCAP Module 1, Lancaster University

Employment

2022 –	Associate Professor with tenure, EECS, University of Michigan
2021 –	Associate Director for the NSF ZEUS facility
2023 –	Associate Professor, NERS, University of Michigan
2014 – 2022	Assistant Professor, EECS, University of Michigan
2016 – 2017	Senior Lecturer, Physics Department, Lancaster University
2011 – 2014	Assistant Research Scientist, NERS, University of Michigan
F12, W14	Adjunct Lecturer, NERS, University of Michigan
2008 – 2011	Postdoctoral Research Fellow, NERS, University of Michigan
2006 – 2008	Research Assistant, Plasma Physics Group, Imperial College London

Research Overview

Author or co-author of 82 published, refereed journal articles
Google Scholar citations = 3550, h-index = 30 (02/23/2024)
74 first author conference or workshop presentations (including 1 plenary and 25 invited oral)
29 seminar or colloquia

Prizes and Awards

2023	EECS Outstanding Achievement Award
2022	APS Fellow
2022	Kavli Fellow
2018	NSF CAREER Award: Relativistic electron driven magnetic reconnection
2012	Outstanding poster, 2012 SSAA Symposium, National Laser Users' Facility
2009	John Dawson Thesis Prize (Worldwide)
2008	European Physical Society – Plasma Physics Division PhD Research Award
2008	Culham Thesis Prize (UK & Ireland) – for significant experimental and numerical work on the acceleration of ions to high energies by laser-plasma interaction
2005	Ian Watts Travel Award to attend the APS-DPP annual meeting, 2005

Principal Investigator

External funding total as PI: $2,993,790

DOE HEDLP	$500,000 (09/2021 – 08/2024) *Direct Laser Acceleration of electrons for bright, directional radiation sources*
DOE HEDP	$400,000 (08/2019 – 07/2022) *Relativistically induced transparency in plasma*
NLUF/NNSA	$400,000 (09/2019 – 09/2021) *Direct Laser Acceleration of electrons for bright, directional radiation sources*
NSF CAREER	$600,000 (05/2018 – 04/2023) *CAREER: Relativistic electron driven magnetic reconnection*
DOE	$645,000 (08/2014 – 08/2017) *Laser-Driven Collisionless Shock Accelerated Ion Beams*
NLUF/NNSA	$353,534 (09/2015 – 08/2017) *Electron Beam Acceleration from Underdense Plasma Using Omega EP*
NLUF/NNSA	$95,256 (06/2013 – 06/2014) *Intense Laser Interactions with Low Density Plasmas Using Omega EP*

External funding as Co-PI

NSF	(Lead institution: Ohio State University, UM PI Willingale) - $250,000 total / $40,000 UM share (07/2022 - 11/2023) *AccelNet-Design: Extreme Light in Intensity, Time and Space*
NSF	(PI Krushelnick) - $18,500,000 (10/2021 - 09/2026) *NSF ZEUS Multi-Petawatt Laser Facility: Operations*
NSF	(PI Krushelnick) - $16,000,000 (09/2019 – 08/2023) *Zettawatt-Equivalent Ultrashort pulse laser System (ZEUS)*
NLUF/NNSA	(PI Krushelnick) - $500,000 (09/2019 – 09/2021) *The dynamics of strong magnetic fields generated by relativistic laser plasma interactions using OMEGA EP*
NLUF/NNSA	(PI Krushelnick) - $390,000 (10/2017 - 09/2019) *Investigations of relativistic reconnection using OMEGA EP – NLUF*

Professional Membership

2022 -	American Physical Society, Fellow (Member, 2012 - 2022)
2023 -	IEEE, Senior Member (Member 2015, 2020-2023)
2010 -	Institute of Physics, Member (Associate Member, 2004-2010)

2013 -	High Energy Density Science Association (HEDSA), Member
2009 -	Omega Laser facility User Group (OLUG), Member
2012 -	Jupiter Laser Facility User Group, Member
2012 -	National Ignition Facility User Group, Member
2012 -	Michigan Institute for Plasma Science and Engineering, Member
2013 - 2016	LLNL Visiting Scientist
2008 - 2012	European Physical Society, Member

Professional Service

Journal referee	Physical Review Letters, Nature Physics, Nature Photonics, Nature Communications, Physics of Plasmas, New Journal of Physics, Applied Physics Letters, Scientific Reports, Matter and Radiation at Extremes, Physical Review E, Plasma Physics and Controlled Fusion, IEEE Transactions on Plasma Science, Journal of Plasma Physics, Journal of Instrumentation, Journal of Physics: Conference Series
2024 - 2026	Associate Editor for the Journal of Plasma Physics
2023 - 2025	Chair of the NIF User Group
2024	Section Organizer of "Particle Acceleration with Lasers and Beams" for 51st IEEE International Conference on Plasma Science (ICOPS2024)
2023	Member of the Laser Plasma Accelerator Workshop (LPAW) Program Committee
2022	Member of the APS Topical Group in Plasma Astrophysics (GPAP) Nominating Committee
2022	Panel member for "Nuclear as Scientific Discovery Panel", Nuclear Science Week, Ann Arbor, MI
2022 - 2024	Elected to the Plasma Science and Applications Executive Committee (PSAC) of the IEEE Nuclear and Plasma Sciences Society
2021 - 2022	Assistant to the Associate Editor for Matter and Radiation at Extremes (MRE), AIP publishing
2021 - 2022	Co-chair for the Multi-Petawatt Physics Prioritization (MP3) Workshop
2020 - 2026	Steering committee member for the Advanced Accelerator Concepts workshop
'16, '18, '20	Organizing committee member for the Advanced Accelerator Concepts workshop
2021 - 2024	Elected to the Omega Laser User Group (OLUG) executive committee
2020 - 2021	Organizing committee member for "Charged Particle Radiography in High-Energy-Density Laboratory Plasmas" workshop
2019 - 2022	Elected to the High Energy Density Science Association (HEDSA) steering committee and Secretary / Treasurer
2019 - 2022	Elected to the NIF User Group executive committee
2021 - 2023	Vice Chair of the NIF User Group
2019 - 2020	Chair of the Particles and Beams program sub-committee for the 2020 APS DPP meeting
'21, '23, '23	Member of a DOE review panel
2020 -	Member of the MEC Upgrade User Advisory Panel
2020	Member of NSF review panels
2018 & 2021	Member of the review panel for a Deutsche Forschungsgemeinschaft Research Unit
2017	Co-leader for Working Group 2: Ion beams from plasmas, for the European Advanced Accelerator Concepts workshop
09/20/2017	External examiner for the DPhil viva of Luke Ceurvorst, University of Oxford, UK
04/07/2017	Faculty opponent for the PhD thesis defense of Lovisa Senje, Lund University, Sweden
'16, '19, '20, '21	Member of the Laboratory Basic Science (LBS) review committee for the Omega Facility

2016	Program Committee for the 58th APS Division of Plasma Physics meeting
2016	Session organizer for the Particle acceleration with Laser and Beams session at ICOPS
'14, '15, '17, '19, '20	NSF proposal referee
'16, '18, '19, '21	DOE proposal referee
2018	Chair for an Advanced Accelerator Concepts meeting (AAC) 2018 plenary session
2018	Chair for APS DPP 2018 session: *Relativistic laser-plasma interaction and particles (ions, electrons, positrons, neutrons) III*
2015	Chair for APS DPP 2015 session: *Laser Plasma Ion Acceleration*
2014	Chair for APS DPP 2014 session: *Ion Acceleration and Neutron Sources*
2012	Chair for APS DPP 2012 sessions: *Intense Laser Plasma Interactions: Experiment* and *Laser Plasma Sources of Electromagnetic Radiation*
2011, 2012	Discussion chair at the Omega Laser Facility User Group Workshop
2009, 2010	Student/Postdoctoral panel at the Omega Laser Facility User Group Workshop
2007 - 2008	Institute of Physics, Plasma Physics Group committee (2007-2008)
2008	Local organization committee for the Institute of Physics Plasma Physics Group 35th Annual Meeting, London
2008	Invited speaker at SET-Routes "Passionate about Research: conversations with women making a difference", Imperial College London, UK

Teaching

University of Michigan:

W19, W20, W21, W22	Instructor for EECS 330: Introduction to Antennas and Wireless systems
W15, W16, W21, W22, W23, W24	Instructor for EECS 334: Principles of Optics (Co-instructor, W16, W21)
F14, F17, F19, W24	Instructor for EECS 598: Special Topics: Laser Plasma Diagnostics - *new course*
F12, W14	Co-instructor for NERS 211: An Introduction to Nuclear Engineering and Radiological Sciences

Guest lectures:

W13, F13	NERS 211: An Introduction to NERS
F12	ENG 110: The Engineering Profession
2011	NERS 674: High Intensity Laser-Plasma Interactions
2009, 2011, 2014	NERS 472: Fusion Reactor Technology

"Summer" school lecturer:

2023	NSF/APS-DPP GPAP Summer School in Plasma Physics for Astrophysicists, lecture on *High Energy Density Physics (HEDP) and Laboratory Astrophysics*
2022	2022 High Energy Density Summer School Foundations of High Energy Density Physics – Virtual, lecture on *Diagnosing High Energy Density Conditions*
2021	NSF/APS-DPP GPAP Summer School in Plasma Physics for Astrophysicists, lecture on *High Energy Density Physics (HEDP) and Laboratory Astrophysics*
2021	Introduction to Fusion Energy and Plasma Physics Course for the Science Undergraduate Laboratory Internship (SULI) program at Princeton Plasma Physics Laboratory (PPPL), lecture on *High Energy Density Physics (HEDP) Short-Pulse Driven Relativistic Plasmas*

2019	CERN Accelerator School (CAS) advanced course on High Gradient Wakefield Acceleration, lecture on *Acceleration of protons and ions*
2018	High Energy Density Summer School, University of Michigan, Ann Arbor, MI, lectures on *Plasma Diagnostics*

Graduate student chair:

Brandon Russell, PhD	ECE, 2022
Hongmei Tang, PhD	ECE, 2023
Brendan Stassel	Applied Physics, due to graduate 2024, PhD
Veronica Contreras	ECE, due to graduate 2025, PhD
Nicolas Kalem	Applied Physics, due to graduate 2028, PhD

Graduate student co-chair:

Amina Hussein, PhD	Applied Physics, 2019
Laura Elgin, PhD	ECE, 2019
Paul T Campbell, PhD	Applied Physics, 2019

Graduate thesis committee member:

Calvin Zulick, PhD	NERS, 2014
Matthew Weiz, PhD	NERS, 2015
Sonal Patel, PhD	NERS, 2016
Anthony Raymond, PhD	Applied Physics, 2016
Jeff Fein, PhD	NERS, 2017
Patrick Wong, PhD	NERS, 2018
Jungmoo Hah, PhD	NERS, 2018
Alexander Rasmus, PhD	Applied Physics, 2019
Peter Kordell, PhD	Physics, 2019
Steven Exelby, PhD	NERS, 2019
Mojtaba Akhavan-Tafti, PhD	CLASP, 2019
Joseph Levesque, PhD	Applied Physics, 2020
Paul C Campbell, PhD	NERS, 2020
Patrick Skrodzki, PhD	NERS, 2021
Bryan Morgan, PhD	NERS, 2022
Mathew Whittlesey, PhD	ECE, 2022
Adrianna Angulo, PhD	Applied Physics, 2023
Mario D Balcazar, PhD	NERS, 2023
Xintao Zhao, PhD	EECS, 2023
Jason Cardarelli	NERS, due to graduate 2023, PhD
Kseniia Konina	NERS, due to graduate 2024, PhD

Advisor for the following student projects:

2021	Undergraduate student summer project UROP undergraduate students (2012/2013, 2014/2015, 2018/2019, 2021/2022)
2014	International student summer project
2013 - 2014	A collaboratory project for Eleanor Tubman (University of York, UK), part of her Fusion Doctoral Training Network program
2013	Summer project and fall term project advisor for a NERS UG student

Lancaster University:

Michelmas 2016	Lecturer for PHYS222: Waves and Optics
2016 - 2017	Supervisor for Postdoctoral Research Fellow, Dr. Charlotte Palmer

Imperial College London:

2007 - 2008	Laboratory demonstrator: for third year undergraduate experiments and MSci and BSc projects – Supervising experiments, assessing, marking reports, providing feedback

University Service

University of Michigan:

2024	MIPSE UM Plasma Prize Committee member
2024	Reviewer, Rackham Merit Fellowship committee
2023	EE Undergraduate Honors and Awards Committee member
F22 - W24	EE Undergraduate Academic Advisor
F22 - W24	ECE Committee for an Inclusive Department (CID) member
F21 - W22	Chair of the Task Force on Improving ECE Climate
2016 - 2021	EE Undergraduate Academic Advisor
2020 - present	Faculty advisor for the student group "Women in Electrical and Computer Engineering" (WECE)
F20 - W21	Member of the ECE ad hoc faculty search committee
2019 - 2023	Member of the Applied Physics graduate admissions committee
2018 - 2019	Member of the ECE committee for an inclusive department
W 2018	Panel member for a GEECS "Professor panel"
May 2015	Panel member for Making the Most of Your First Summer in Grad School workshop, College of Engineering, University of Michigan
2015, 2016	Evaluated ECE Graduate applications for the Optics group
2016 - 2016	Member of the ECE Undergraduate Recruiting and Activities Committee

Lancaster University:

2016 - 2017	Head of Cockcroft Institute Education & Training
2016 - 2017	Plagiarism Officer for the Physics Department

Refereed Journal Articles

Graduate student advisees, Postdoctoral Researcher advisees, and Undergraduate student advisees.

1. R. Babjak, **L. Willingale**, A. Arefiev, M. Vranic, *Direct laser acceleration in underdense plasmas with multi-PW lasers: a path to high-charge, GeV-class electron bunches*, accepted for publication in Physical Review Letters (2024).
2. A.V. Arefiev, I-L. Yeh, K. Tangtartharakul, **L. Willingale**, *Electron energy gain due to a laser frequency modulation experienced by electron during betatron motion*, Physics of Plasmas, **31**, 023106 (2024).
3. P. T. Campbell, B. K. Russell, C. Dong, G. Fiksel, P. M. Nilson, A. G. R. Thomas, C. A. Walsh, K. M. Krushelnick, and **L. Willingale**, *Formation of collisionless shocks driven by strongly magnetized relativistic electrons in the laboratory*, Physical Review Research, **6**, L012016 (2024).
4. Derek B. Schaeffer, Archie F.A. Bott, Marco Borghesi, Kirk A. Flippo, William Fox, Julien Fuchs, Chikang Li, Hye-Sook Park, Fredrick H. Seguin, Petros Tzeferacos, **Louise Willingale**, *Proton*

Imaging of High-Energy-Density Laboratory Plasmas, Reviews of Modern Physics, **95**, 045007 (2023).

5. Brandon K. Russell, Paul T. Campbell, Qian Qian, Jason A. Cardarelli, Stepan S. Bulanov, Sergei V. Bulanov, Gabriele M. Grittani, Daniel Seipt, **Louise Willingale**, and Alexander G. R. Thomas, *Ultrafast relativistic electron probing of extreme magnetic fields*, Physics of Plasmas, **30**, 093105 (2023). [Editors pick]

6. A. Maitrallain, E. Brunetti, M. J. V. Streeter, B. Kettle, R. Spesyvtsev, G. Vieux, M. Shahzad, B. Ersfeld, S. R. Yoffe, A. Kornaszewski, O. Finlay, Y. Ma, F. Albert, N. Bourgeois, S. J. D. Dann, N. Lemos, S. Cipiccia, J. M. Cole, I. Gallardo González, **L. Willingale**, A. Higginbotham, A. E. Hussein, M. Smid, K. Falk, K. Krushelnick, N. C. Lopes, E. Gerstmayr, C. Lumsdon, O. Lundh, S. P. D. Mangles, Z. Najmudin, P. P. Rajeev, D. R. Symes, A. G. R. Thomas, D. A. Jaroszynski, *Parametric study of high-energy ring-shaped electron beams from a laser wakefield accelerator*, New Journal of Physics, **24**, 013017 (2022).

7. C. Clarke, E. Esarey, C. Geddes, G. Hofstaetter, M. J. Hogan, S. Nagaitsev, M. Palmer, P. Piot, J. Power, C. Schroeder, D. Umstadter, N. Vafaei-Najafanadi, A. Valishev, **L. Willingale**, and V. Yakimenko, *US Advanced and Novel Accelerator Beam Test Facilities*, Journal of Instrumentation, **17**, T05009 (2022).

8. P. T. Campbell, C. A. Walsh, B. K. Russell, J. P. Chittenden, A. Crilly, G. Fiksel, L. Gao, I. V. Igumenshchev, P. M. Nilson, A. G. R. Thomas, K. Krushelnick, and **L. Willingale**, *Measuring magnetic flux suppression in high-power laser-plasma interactions*, Physics of Plasmas, **29**, 012701 (2022).

9. I-L. Yeh, K. Tangtartharakul, H. Rinderknecht, **L. Willingale**, A. V. Arefiev, *Strong interplay between superluminosity and radiation friction during direct laser acceleration*, New Journal of Physics, **23**, 095010 (2021).

10. J. von der Linden, G. Fiksel, J. Peebles, M. Edwards, **L. Willingale**, A. Link, D. Mastrosimone, and H. Chen, *Confinement of Relativistic Electrons in a Magnetic Mirror en Route to a Magnetized Relativistic Pair Plasma*, Physics of Plasmas, **28**, 092508 (2021).

11. B. K. Russell, P. T. Campbell, A. G. R. Thomas, **L. Willingale**, *Multiple species laser driven shock-ion acceleration*, Plasma Physics and Controlled Fusion, **63**, 095012 (2021).

12. T. Shi, D. Sun, I. Jovanovic, G. Kalinchenko, K. Krushelnick, C. Kuranz, A. Maksimchuk, J. Nees, A. G. R. Thomas, **L. Willingale**, *Optimization of the Electron Beam Dump for a GeV-class Laser Electron Accelerator*, Applied Radiation and Isotopes, **176**, 109853 (2021).

13. J. L. Peebles, G. Fiksel, M. Edwards, J. von der Linden, **L. Willingale**, D. Mastrosimone, Hui Chen, *Magnetically collimated relativistic charge-neutral electron-positron beams from high-power lasers*, Physics of Plasmas, **28**, 074501 (2021).

14. J. von der Linden, J. Ramos-Mendez, B. Faddegon, D. Massin, G. Fiksel, J. Holder, **L. Willingale**, J. Peebles, M. Edwards, and H. Chen, *Dispersion calibration for the National Ignition Facility electron-positron-proton spectrometers for intense laser matter interactions*, Review of Scientific Instruments, **92**, 033516 (2021).

15. A. E. Hussein, A. V. Arefiev, T. Batson, H. Chen, R. S. Craxton, A. S. Davies, D. H. Froula, Z. Gong, D. Haberberger, Y. Ma, P. M. Nilson, W. Theobald, T. Wang, K. Weichman, G. J. Williams, and **L. Willingale**, *Towards the Optimization of Direct Laser Acceleration*, New Journal of Physics, **23**, 023031 (2021).

16. E. R. Tubman, A. S. Joglekar, A. F. A. Bott, M. Borghesi, B. Coleman, G. Cooper, C. N. Danson,

P. Durey, J. M. Foster, P. Graham, G. Gregori, E. T. Gumbrell, M. P. Hill, T. Hodge, S. Kar, R. J. Kingham, M. Read, C. P. Ridgers, J. Skidmore, C. Spindloe, A. G. R. Thomas, P. Treadwell, S. Wilson, **L. Willingale**, N. C. Woolsey, *Observations of pressure anisotropy effects within semi-collisional magnetized plasma bubbles*, Nature Communications **12**, 334 (2021).

17. J. Kim, A. Link, D. Canning, P. Fitzsimmons, J. A. Fooks, S. Kerr, T. Ma, M. Manuel, D. Mariscal, R. Wallace, G. J. Williams, **L. Willingale**, F. N. Beg, and H. Chen, *Dynamic focusing of laser driven positron jets by self-generated fields*, New Journal of Physics, **22**, 123020 (2020).

18. H. Tang, B. K. Russell, A. Maksimchuk, P. T. Campbell, M. J.-E. Manuel, and **L. Willingale**, *Scintillator detector characterization for laser-driven proton beam imaging*, Review of Scientific Instruments, **91**, 123304 (2020).

19. M. R. Stoneking, T. Sunn Pedersen, P. Helander, H. Chen, U. Hergenhahn, E. V. Stenson, G. Fiksel, J. von der Linden, H. Saitoh, C. M. Surko, J. R. Danielson, C. Hugenschmidt, J. Horn-Stanja, A. Mishchenko, D. Kennedy, A. Deller, A. Card, S. Nißl, M. Singer, S. König, **L. Willingale**, J. Peebles, M. R. Edwards, and K. Chin, *A new frontier in laboratory physics: magnetized electron-positron plasmas*, Journal of Plasma Physics, **86**, 155860601 (2020).

20. M. J.-E. Manuel, H. Tang, B. K. Russell, **L. Willingale**, A. Maksimchuk, J. S. Green, N. Alfonso, J. Jaquez, L. Carlson, D. Neely, T. Ma, *Enhanced spatial resolution of Eljen-204 plastic scintillators for use in rep-rated proton diagnostics*, Review of Scientific Instruments, **91**, 103301 (2020).

21. P. T. Campbell, C. A. Walsh, B. K. Russell, J. P. Chittenden, A. Crilly, G. Fiksel, P. M. Nilson, A. G. R. Thomas, K. Krushelnick, and **L. Willingale**, *Magnetic signatures of radiation-driven double ablation fronts*, Physical Review Letters, **125**, 145001 (2020).

22. G. J. Williams, A. Link, M. Sherlock, D. A. Alessi, M. Bowers, A. Conder, P. Di Nicola, G. Fiksel, F. Fiuza, M. Hamamoto, M. R. Hermann, S. Herriot, D. Homoelle, W. Hsing, E. d'Humiéres, D. Kalantar, A. Kemp, S. Kerr, J. Kim, K. N. Lafortune, J. Lawson, R. Lowe-Webb, T. Ma, D. A. Mariscal, D. Martinez, M. J.-E. Manuel, M. Nakai, L. Pelz, M. Prantil, B. Remington, R. Sigurdsson, C. Widmayer, W. Williams, **L. Willingale**, R. Zachariason, K. Youngblood, and Hui Chen, *Production of relativistic electrons at subrelativistic laser intensities*, Physical Review E, **101**, 031201 (2020).

23. P. T. Campbell, D. Canning, A. E. Hussein, K. Ratnayaka, A. G. R. Thomas, K. Krushelnick, and **L. Willingale**, *Proton beam emittance growth in multipicosecond laser-solid interactions*, New Journal of Physics, **21**, 103021 (2019).

24. C. A. J. Palmer, P. T. Campbell, Y. Ma, L. Antonelli, A. F. A. Bott, G. Gregori, J. Halliday, Y. Katzir, P. Kordell, K. Krushelnick, S. V. Lebedev, E. Montgomery, M. Notley, D. C. Carroll, C. P. Ridgers, A. A. Schekochihin, M. J. V. Streeter, A. G. R. Thomas, E. R. Tubman, N. Woolsey, and **L. Willingale**, *Field reconstruction from proton radiography of intense laser driven magnetic reconnection*, Physics of Plasmas, **26**, 083109 (2019).

25. A. E. Hussein, N. Senabulya, Y. Ma, M. J. V. Streeter, B. Kettle, S. J. D. Dann, F. Albert, N. Bourgeois, S. Cipiccia, J. M. Cole, O. Finlay, E. Gerstmayr, I. Gallardo González, A. Higginbotham, D. A. Jaroszynski, K. Falk, K. Krushelnick, N. Lemos, N. C. Lopes, C. Lumsdon, O. Lundh, S. P. D. Mangles, Z. Najmudin, P. P. Rajeev, C. M. Schlepütz, M. Shahzad, M. Smid, R. Spesyvtsev, D. R. Symes, G. Vieux, **L. Willingale**, J. C. Wood, A. J. Shahani, and A. G. R. Thomas, *Laser-wakefield accelerators for high-resolution X-ray imaging of complex microstructures*, Scientific Reports, **9**, 3249 (2019)

26. A. Flacco and **L. Willingale**, *Summary of working group 2: Ion beams from plasmas*, Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrom-

eters, Detectors and Associated Equipment, **909**, 153 (2018)

27. Yong Ma, Daniel Seipt, Stephen Dann, Matthew James Victor Streeter, Charlotte Palmer, **Louise Willingale**, and Alexander Thomas, *Angular streaking of betatron X-rays in a transverse density gradient laser-wakefield accelerator*, Physics of Plasmas **25**, 113105 (2018)

28. A. Raymond, C. F. Dong, A. McKelvey, C. Zulick, N. Alexander, A. Bhattacharjee, P. T. Campbell, H. Chen, V. Chvykov, E. Del Rio, P. Fitzsimmons, W. Fox, B. Hou, A. M. Maksimchuk, C. Mileham, J. Nees, P. M. Nilson, C. Stoeckl, A. G. R. Thomas, M. S. Wei, V. Yanovsky, K. Krushelnick, and **L. Willingale**, *Relativistic electron driven magnetic reconnection in the laboratory*, Physical Review E, **98**, 043207 (2018)

29. **L. Willingale**, A. V. Arefiev, G. J. Williams, H. Chen, F. Dollar, A. U. Hazi, A. Maksimchuk, M. J.-E. Manuel, E. Marley, W. Nazarov, T. Z. Zhao, and C. Zulick, *The Unexpected Role of Evolving Longitudinal Electric Fields in Generating Energetic Electrons in Relativistically Transparent Plasmas*, New Journal of Physics, **20**, 093024 (2018)

30. 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 Journal of Physics, **19**, 063014 (2017)

31. C. Zulick, A. Raymond, A. McKelvey, V. Chvykov, A. Maksimchuk, A. G. R. Thomas, **L. Willingale**, V. Yanovsky, and K. Krushelnick, *Target surface area effects on hot electron dynamics from high intensity laser-plasma interactions*, New Journal of Physics, **18**, 063020 (2016)

32. A. V. Arefiev, V. N. Khudik, A. P. L. Robinson, G. Shvets, **L. Willingale**, and M. Schollmeier, *Beyond the ponderomotive limit: direct laser acceleration of relativistic electrons in sub-critical plasmas*, Physics of Plasmas, **23**, 056704 (2016)

33. **L. Willingale**, P. M. Nilson, C. Zulick, H. Chen, R. S. Craxton, J. Cobble, A. Maksimchuk, P. A. Norreys, T. C. Sangster, R. H. H. Scott, and C. Stoeckl, *Relativistic intensity laser interactions with low-density plasmas*, Journal of Physics: Conference Series: 8th International Conference of Inertial Fusion Science and Applications (IFSA 2013), **688**, 012126 (2016)

34. A. V. Arefiev, V. N. Khudik, A. P. L. Robinson, G. Shvets, and **L. Willingale**, *Spontaneous emergence of non-planar electron orbits during direct laser acceleration by a linearly polarized laser pulse*, Physics of Plasmas, **23**, 023111 (2016)

35. **L. Willingale**, S. R. Nagel, A. G. R. Thomas, C. Bellei, R. J. Clarke, A. E. Dangor, R. Heathcote, M. C. Kaluza, C. Kamperidis, S. Kneip, K. Krushelnick, N. Lopes, S. P. D. Mangles, W. Nazarov, P. M. Nilson, and Z. Najmudin, *Characterization of laser-driven proton beams from near-critical density targets using copper activation*, Journal of Plasma Physics, **81**, 365810102 (2015)

36. **L. Willingale**, A. G. R. Thomas, A. Maksimchuk, A. Morace, T. Bartel, J. Kim, R. B. Stephens, M. S. Wei, F. N. Beg, and K. Krushelnick, *Investigation of relativistic intensity laser generated hot electron dynamics via copper K_α imaging and proton acceleration*, Physics of Plasmas, **20**, 123112 (2013)

37. 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*, Applied Physics Letters, **103**, 141117 (2013)

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Conference Presentations (as presenting author only)

1. Stewardship Science Academic Programs (SSAP) Symposium, Arlington, VA, February 21-22, 2024
   Talk: *Direct Laser Acceleration of electrons for bright, directional radiation sources*
2. NIF and JLF User Group Meeting 2024, Livermore, CA, 30 January - 1st February, 2024
   Poster: *The ZEUS laser user facility*
3. 65th Annual Meeting of the APS Division of Plasma Physics, Denver, CO, October 30 - November 3, 2023
   Poster: *TP11.00050 : The ZEUS laser user facility*
4. 6th European Advanced Accelerator Concepts (EAAC) 2023, La Biodola Bay, Isola d'Elba, Italy, 17-23 September, 2023
   Contributed Talk: *The X-lites Network*
   Contributed Talk: *The ZEUS laser user facility*
5. Nuclear Photonics 2023, Durham, NC, September 11-15, 2023
   Invited talk: *Multi-Petawatt Physics Prioritization (MP3)*
6. LANL Advanced Diagnostics program Workshop: II. Laser Technology/Laser/Matter Interactions, Los Alamos, NM, June 14, 2023
   Invited talk: *The 3-PW ZEUS laser user facility*
   Invited talk: *Proton deflectometry for measuring magnetic field dynamics*
7. 2023 IEEE International Conference on Plasma Science (ICOPS), Santa Fe, NM, May 21-25, 2023
   Invited talk: *The influence of focusing geometry on the Direct Laser Acceleration of electrons*
   Poster: *Status of the ZEUS laser user facility*
8. Conference on Lasers and Electro-Optics (CLEO) 2023, San Jose, California, USA, May 7-12, 2023
   Invited talk: *Performance and Status of the Zettawatt Equivalent Ultrashort pulse laser facility*
9. SPIE Optics + Optoelectronics 2023, Prague, Czech Republic, April 24-27, 2023
   Plenary talk: *Exploring plasma physics with multi-petawatt laser pulses*
10. 2023 Stewardship Science Academic Programs Annual Review Symposium, Santa Fe, NM, February 14-15, 2023
    Talk: *Direct Laser Acceleration of electrons for bright, directional radiation sources*
11. International Conference on Research Infrastructures (ICRI) 2022, Brno, Czech Republic (attended virtually), October 19-21, 2022
    Invited talk: *The High-Power Laser Facilities Research Ecosystem*
12. 13th International Conference on High Energy Density Laboratory Astrophysics - HEDLA 2022, Lisbon, Portugal, May 23-27, 2022
    Invited talk: *Bow shock formation in a asymmetric relativistic electron driven magnetic reconnection geometry*
13. Fourth Purdue Workshop on Relativistic Plasma Astrophysics, Lafayette, IN, May 9-11, 2022
    Talk: *Relativistic Laboratory Astrophysics*
14. National Academy of Sciences' thirty-second annual Kavli Frontiers of Science symposium, Irvine, California, April 8-10, 2022

Invited talk: *Laser Driven Magnetic Reconnection*

15. The ECLIPSE Meeting 2022, Alexandria, VA, March 9-11, 2022
Invited talk: *The 3-Petawatt ZEUS Laser Facility*

16. 2022 Stewardship Science Academic Programs Annual Review Symposium, virtual
Talk: *Direct Laser Acceleration of electrons for bright, directional radiation sources*

17. 63rd Annual Meeting of the APS Division of Plasma Physics, Pittsburgh, PA, November 8-12, 2021
Talk: *CO03.00008: Measuring magnetic flux suppression in high-power laser-plasma interactions*

18. The 4th Extremely High Intensity Laser Physics Conference (ExHILP 2021), September 13-17, 2021
Invited talk: *The 3PW NSF ZEUS user facility*

19. European Conference on Plasma Diagnostics (ECPD, 2021), virtual, June 7-11, 2021
Invited talk: *Proton deflectometry to study magnetic field generation, dynamics and reconnection*

20. 2021 Stewardship Science Academic Programs Annual Review Symposium, virtual
Talk: *Direct Laser Acceleration of electrons for bright, directional radiation sources*

21. 2020 Stewardship Science Academic Programs Annual Review Symposium, Washington DC, USA
Talk: *Direct Laser Acceleration of electrons for bright, directional radiation sources*
Talk: *The dynamics of strong magnetic fields generated by relativistic laser plasma interactions using OMEGA EP*

22. 1st ELI-NP user workshop (2019), Bucharest, Romania
Contributed talk: *Direct Laser Acceleration of electrons in high-intensity laser plasma interactions*

23. 1st community workshop of the HEDP topical area for the APS DPP Community Planning Process, Maryland, MD (2019)
Lightning talk: *Direct Laser Acceleration of electrons by high-intensity laser pulses*

24. 46th EPS Conference on Plasma Physics 2019, Milan, Italy
Invited talk: *Magnetic field generation, dynamics, and reconnection driven by relativistic intensity laser-plasma interactions*

25. 2019 Stewardship Science Academic Programs Annual Review Symposium, Albuquerque, NM, USA
Talk: *Investigations of Relativistic Laser Driven Reconnection using OMEGA EP*

26. Super-Intense Laser-Atom Physics (SILAP) 2018, Toronto, Canada
Invited talk: *Magnetic field generation, dynamics, and reconnection driven by relativistic intensity laser-plasma interactions*

27. 60th Annual Meeting of the APS Division of Plasma Physics 2018, Portland, OR, USA
Invited talk: *CI2.00001: Magnetic field generation, dynamics, and reconnection driven by relativistic intensity laser-plasma interactions*
Contributed talk: *UO6.00004: The effect of laser pulse duration on proton radiography*

28. 18th Advanced Accelerator Concepts Workshop (AAC 2018), Breckenridge, CO, USA
Contributed talk: *The effect of laser pulse duration on proton radiography*

29. SPIE Optics and Optoelectronics 2017, Prague, Czech Republic
Invited talk: *Direct laser acceleration of electrons from underdense plasma channeling using picosecond laser pulses*

30. The 3rd International Conference on High Energy Density Physics (ICHEDP-3, 2016), Shenzhen, China
Invited talk: *Relativistic Magnetic Reconnection in the Laboratory*

31. 17th Advanced Accelerator Concepts Workshop (AAC 2016), National Harbor, MD, USA
Contributed talk: *Electron acceleration by high-intensity picosecond laser pulses*

32. 2015 Christmas Meeting of the High Power Laser Community, Abingdon, UK
Contributed talk: *Magnetic Reconnection Experiments Using Laser Generated Relativistic Electron Currents*

33. 57th Annual Meeting of the APS Division of Plasma Physics 2015, Savannah, GA, USA
Contributed talk: *JO7.00001: Electron heating mechanisms for a relativistic intensity laser pulse interacting with a near-critical plasma*

34. LaB workshop on Magnetic Fields in High Energy Density Plasmas, Nov 2015, Princeton, NJ, USA
Invited talk: *Magnetic Reconnection Experiments Using Laser Generated Relativistic Electron Currents*

35. US-Japan Workshop on fast ignition and relevant high energy-density physics, Nov 2014, Austin, TX, USA
Invited talk: *Channeling and electron acceleration from underdense and near-critical density plasmas*

36. 56th Annual Meeting of the APS Division of Plasma Physics 2014, New Orleans, LA, USA
Contributed talk: *UO5.00011: Proton probing of a relativistic laser interaction with near-critical plasma*

37. OMEGA Laser Facility Users Group Workshop 2014, Rochester, NY, USA
Contributed poster: *Intense Laser Interactions with Low Density Plasma using the Omega EP laser*

38. NIF and JLF User Group Meeting 2014, LLNL, CA, USA
Invited talk: *The interaction of a relativistically intense laser pulse with near-critical density plasma*
Contributed poster: *The interaction of a relativistically intense laser pulse with near-critical density plasma*

39. 55th Annual Meeting of the APS Division of Plasma Physics 2013, Denver, CO, USA
Contributed talk: *TO7.00010: Interaction of relativistic laser pulses with near-critical density plasma*

40. The Eighth International Conference on Inertial Fusion Sciences and Applications 2013, Nara, Japan
Contributed talk: *Relativistic intensity laser interactions with low-density plasmas*

41. 2013 Stewardship Science Academic Programs Annual Review Symposium, Albuquerque, NM, USA
Talk: *Intense Laser Interactions with Low Density Plasma Using OMEGA EP*
Contributed poster: *Intense Laser Interactions with Low Density Plasma Using OMEGA EP*

42. 54th Annual Meeting of the APS Division of Plasma Physics 2012, Providence, RI, USA
Contributed talk: *NO5.00011: Relativistic laser interactions with near-critical density plasmas*

43. OMEGA Laser Facility Users Group Workshop 2012, Rochester, NY, USA
Contributed poster: *Intense Laser Interactions with Low Density Plasma using the Omega EP laser*

44. 2012 Stewardship Science Academic Alliances Symposium, Washington DC, USA
Talk: *Intense Laser Interactions with Low Density Plasma Using OMEGA EP*
Contributed poster: *Intense Laser Interactions with Low Density Plasma Using OMEGA EP*

45. 53rd Annual Meeting of the APS Division of Plasma Physics 2011, Salt Lake City, UT, USA
Contributed talk: *JO6.00003: High-power, kilojoule class laser channeling, surface wave genera-*

tion and particle acceleration from underdense plasma

46. 38th EPS Conference on Plasma Physics 2011, Strasbourg, France
Invited talk: *Proton probing of laser-plasma interaction phenomena: Fast advection of magnetic fields and high-power laser channeling*

47. OMEGA Laser Facility Users Group Workshop 2011, Rochester, NY, USA
Contributed talk: *High-power laser interactions with underdense plasma: Channeling, surface waves and electron acceleration*

48. High Power Laser Science Community Meeting 2010, Abingdon, UK
Contributed talk: *High-power, kilojoule class laser channeling in millimeter scale underdense plasma*

49. 52nd Annual Meeting of the APS Division of Plasma Physics 2010, Chicago, IL, USA
Invited talk: *TI3.00004: High-power, kilojoule class laser channeling in millimeter scale underdense plasma*
Contributed talk: *GO6.00010: Fast advection of magnetic fields by hot electrons*

50. 2010 Advanced Accelerator Concepts Workshop, Annapolis, MD, USA
Contributed talk: *Ion acceleration from underdense to near-critical density plasmas using the Omega EP laser*

51. OMEGA Laser Facility Users Group Workshop 2010, Rochester, NY, USA
Contributed talk: *Proton probing of a 1 kJ, 10 ps laser pulse interaction with underdense to near-critical density plasmas*
Contributed poster: *Omega EP laser propagation through underdense plasma*

52. Inertial Fusion Science and Applications 2009, San Francisco, CA, USA
Contributed poster: *Omega EP laser propagation through near-critical density plasma*

53. Laser and Plasma Accelerator Workshop 2009, Kardamili, Greece
Invited lightning round talk: *Ion Acceleration from Underdense Targets*

54. OMEGA Laser Facility Users Group Workshop 2009, Rochester, NY, USA
Contributed talk: *Laser propagation and particle acceleration from near-critical density targets*

55. 35th EPS Conference on Plasma Physics and the 10th international Workshop on Fast Ignition of Fusion Targets 2008, Hersonissos, Greece
Invited talk for EPS PPD PhD research award: *Laser plasma interactions in the relativistic transparent regime*

56. 35th IoP Annual Conference on Plasma Physics 2008, London, UK
Invited talk for the Culham thesis prize: *Ion acceleration from underdense to near critical density plasmas*

57. Laser and Plasma Accelerators Workshop 2007, Azores, Portugal
Contributed talk: *Ion acceleration from underdense to near critical density plasmas*

58. High Power Laser Science Community Meeting 2006, Abingdon, UK
Contributed talk: *Measurements of magnetic fields in two beam laser-solid interactions using proton grid deflectometry*

59. 9th International Fast Ignition Workshop 2006, Cambridge, MA, USA
Contributed poster: *Proton acceleration from critical density foams with the Vulcan Petawatt laser*

60. 48th Annual Meeting of the APS Division of Plasma Physics 2006, Philadelphia, PA, USA

Contributed talk: *JO2.00009: Measurements of magnetic fields in two beam laser-solid interactions using proton grid deflectometry*

61. 33rd IoP Annual Conference on Plasma Physics 2006, Creiff, UK
Contributed talk: *Ion Acceleration in the Forward Direction From High-Intensity Laser Interactions With Underdense Plasma*

62. High Power Laser Science Community Meeting 2005, Abingdon, UK
Contributed talk: *Collimated Multi-MeV Ion Beams in the Forward Direction from High-Intensity Laser Interactions with Underdense Plasma*

63. 47th Annual Meeting of the APS Division of Plasma Physics 2005, Denver, CO, USA
Contributed talk: *KO1.00013: Collimated Multi-MeV Ion Beams in the Forward Direction from High-Intensity Laser Interactions With Underdense Plasma*

64. High Power Laser Science Community Meeting 2004, Abingdon, UK
Contributed talk: *Ion Acceleration from Underdense Plasma with the Vulcan Petawatt Laser*

Conference Presentations (Partial list of co-authored presentations)

65th Annual Meeting of the APS Division of Plasma Physics, 2023

1. I-Lin Yeh, Kavin Tangtartharakul, Hongmei Tang, **Louise Willingale**, Alex V Arefiev, *CO08.00005: Efficient backward x-ray emission in a plasma irradiated by a ps laser pulse*

2. Hongmei Tang, Veronica Contreras, Robert Babjak, Felicie Albert, Hui Chen, Paul T Campbell, Yong Ma, Philip M Nilson, Brandon K Russell, Jessica Shaw, Kavin Tangtartharakul, I-Lin Yeh, Alex V Arefiev, Marija Vranic, **Louise Willingale**, *GO08.00013: The Effect of Plasma Density Gradient on the Direct Laser Acceleration of Electrons*

3. Robert Babjak, **Louise Willingale**, Alexey V Arefiev, Marija Vranic, *JP11.00009: Generalized description of the efficient electron acceleration in ion channels by multi-PW lasers*

4. Veronica Contreras, Hongmei Tang, Felicie Albert, Paul T Campbell, Hui Chen, Yutong He, Yong Ma, Philip M Nilson, Brandon K Russell, Jessica Shaw, Kavin Tangtartharakul, I-Lin Yeh, Alexey V Arefiev, **Louise Willingale**, *JP11.00027: Measuring Coulomb Explosion Ions from OMEGA EP Interactions*

5. Brendan L Stassel, Hongmei Tang, Paul T Campbell, Brandon K Russell, Alexander G Thomas, Nicholas Czapla, Pedro Spingola, German Tiscareno, Ali Rahimi, Rebecca L Daskalova, Douglass W Schumacher, **Louise Willingale**, *PO05.00008: Simulation and Experimental Measurements of Relativistic Transparency in Plasmas with Ultrafast High Intensity Laser Pulses*

6. Anatoly M Maksimchuk, John Nees, Bixue Hou, Franko Bayer, Milos Burger, Paul T Campbell, Galina Kalinchenko, Sallee R Klein, Yong Ma, Andrew McKelvey, Elizabeth Oxford, Richard Van Camp, Lauren Weinberg, Qing Zhang, Andre Antoine, Junwoo Bae, Mario Balcazar, Jason A Cardarelli, Veronica Contreras, Nick Ernst, Rebecca Fitzgarrald, Joshua Latham, William Likes, Qian Qian, Igor Jovanovic, Carolyn C Kuranz, Alexander G Thomas, **Louise Willingale**, Karl Krushelnick, *TP11.00047: Updates on the construction and commissioning of the ZEUS facility*

7. Karl Krushelnick, Joshua Latham, Brandon K Russell, Paul T Campbell, Gennady Fiksel, Philip M Nilson, **Louise Willingale**, *UP11.00034: Magnetic field generation mechanisms of a relativistic laser between colliding magnetized plasma plumes*

8. Sahel Hakimi, Lieselotte Obst-Huebl, Stepan S Bulanov, Kei Nakamura, Axel Huebl, Jared De Chant, Aodhan McIlvenny, Kelly K Swanson, Elizabeth S Grace, Raspberry Simpson, Jackson G Williams, Derek Mariscal, Scott C Wilks, Brendan L Stassel, **Louise Willingale**, Thomas Schenkel,

Jean-Luc Vay, Carl B Schroeder, Anthony J Gonsalves, Jeroen van Tilborg, Eric H Esarey, Cameron Geddes, *YO06.00001: Experimental investigation of the magnetic vortex acceleration regime*

64th Annual Meeting of the APS Division of Plasma Physics, 2022

9. Hongmei Tang, Paul T Campbell, Brandon K Russell, Yong Ma , I-Lin Yeh, Kavin Tangtartharakul, Alex V Arefiev, Hui Chen, Felicie Albert, Jessica L Shaw, Philip M Nilson, **Louise Willingale**, *GO08.00015: The Effect of Laser Focusing Geometry on the Direct Laser Acceleration of Electrons*

10. Paul T Campbell, Brandon K Russell, Gennady Fiksel, Jason A Cardarelli, Qian Qian, Karl M Krushelnick, **Louise Willingale**, Alexander G Thomas, *JP11.00002: Ultrafast electron probing of extreme magnetic fields*

11. Rebecca J Fitzgarrald, Yong Ma, Jason A Cardarelli, Paul T Campbell, Mario Balcazar, Andre F Antoine, Nick Beier, Sylvain Fourmaux, Sallee R Klein, Meriame Berboucha, Amina E Hussein, Brendan Kettle, Karl M Krushelnick, Stuart P.D. Mangles, Qian Qian, Gianluca Sarri, Daniel Seipt, Vigneshvar Senthilkumaran, Rob Shalloo, Matthew Streeter, **Louise Willingale**, Alexander G Thomas, *JP11.00003: Filter Pack X-ray Spectrum Reconstruction for Betatron Streaking Experiment*

12. I-Lin Yeh, **Louise Willingale**, Alexey Arefiev, *JP11.00022: Higher-order resonance as the main energy gain mechanism during direct laser acceleration of electrons*

13. Kavin Tangtartharakul, Ilin Yeh, Hongmei Tang, Tao Wang, **Louise Willingale**, Alexey Arefiev, *JP11.00026: Mitigation of the detrimental role of the longitudinal laser electric field during direct laser acceleration of electrons*

14. Jason A Cardarelli, Yong Ma, Paul T Campbell, Rebecca J Fitzgarrald, Andre F Antoine, Meriame Berboucha, Reed C Hollinger, Brendan Kettle, Karl M Krushelnick, Stuart P.D. Mangles, John T Morrison, Ryan Nedbailo, Qian Qian, Jorge J Rocca, Gianluca Sarri, Daniel Seipt, Huanyu Song, Matthew Streeter, Shoujun Wang, **Louise Willingale**, Alexander G Thomas, *NO08.00009: Parametric study of the current filamentation instability using laser wakefield accelerated electron beams*

15. Brendan L Stassel, Hongmei Tang, Paul T Campbell, Brandon K Russell, Alexander G Thomas, Nicholas Czapla, Pedro Spingola, German Tiscareno, Ali Rahimi, Rebecca L Daskalova, Douglass W Schumacher, **Louise Willingale**, *NO08.00014: Identifying Trends in Self-Induced Relativistic Transparency in Plasmas with Ultrafast High Intensity Laser Pulses*

16. Anatoly M Maksimchuk, John Nees, Galina Kalinchenko, Bixue Hou, Yong Ma, Andrew McKelvey, Tan Shi, Paul T Campbell, Andre F Antoine, Mario Balcazar, Jason A Cardarelli, Nicholas Ernst, Rebecca Fitzgarrald, Colton Graham, Joshua Latham, Qian Qian, Igor Jovanovic, Carolyn C Kuranz, Alexander G Thomas, **Louise Willingale**, Karl M Krushelnick, *NP11.00103: Construction and commissioning of the ZEUS laser system at the University of Michigan*

17. John Nees, Anatoly M Maksimchuk, Andrew McKelvey, Galina Kalinchenko, Bixue Hou, Paul T Campbell, Yong Ma, Nicholas Ernst,Igor Jovanovic, Carolyn C Kuranz, **Louise Willingale**, Alexander G Thomas, Karl M Krushelnick, *NP11.00104: Zetawatt-Equivalent Ultra-short-pulse laser System (ZEUS)*

18. Robert Babjak, Marija Vranic, **Louise Willingale**, Alex V Arefiev, *PO08.00014: A robust scheme to obtain high charge (~ 100 nC) relativisitic ($>$ GeV) electron beams with PW lasers through DLA*

19. Brandon K Russell, Paul T Campbell, Chuanfei Dong, Gennady Fiksel, Philip M Nilson, Alexander G Thomas, Christopher A Walsh, Karl M Krushelnick, **Louise Willingale**, *TO06.00003: Experimental study of semi-relativistic quasi-perpendicular shock formation*

20. Joshua Latham, Brandon K Russell, **Louise Willingale**, Paul T Campbell, Gennady Fiksel, Philip M Nilson, Karl M Krushelnick, *TO06.00004: Relativistic laser perturbation to laser-driven magnetic reconnection*

21. Yong Ma, Jason A Cardarelli, Paul T Campbell, Rebecca Fitzgarrald, Mario Balcazar, Andre F Antoine, Nicholas F Beier, Sylvain Fourmaux, Meriame Berboucha, Amina E Hussein, Brendan Kettle, Sallee R Klein, Karl M Krushelnick, Stuart P.D. Mangles, Qian Qian, Gianluca Sarri, Daniel Seipt, Vigneshvar Senthilkumaran, Rob Shalloo, Matthew Streeter, **Louise Willingale**, Alec G.R. Thomas, *TO08.00013: Streaking of betatron X-rays in a curved laser wakefield accelerator*

22. Brandon K Russell, Marija Vranic, Paul T Campbell, Alexander G Thomas, Kevin M. Schoeffler, Dmitri A Uzdensky, **Louise Willingale**, *UM09.00008: Extreme magnetic field generation in ultra-intense laser solid interactions*

63rd Annual Meeting of the APS Division of Plasma Physics, 2021

23. H. Tang, A. McKelvey, P. T. Campbell, B. K. Russell, Y. Ma, A. V. Arefiev, I-L Yeh, K. Tangtartharakul, H. Chen, F. Albert, J. Shaw, P. M. Nilson, **L. Willingale**, *BO04.00001: High Energy, Relativistic Intensity Laser Channeling and Direct Laser Acceleration of Electrons from an Underdense Plasma*

24. B. K. Russell, P. T. Campbell, A. G. Thomas, **L. Willingale** *BM10.00005: Multiple species laser-driven ion-shock acceleration*

25. B. Stassel, B. K. Russell, P. T. Campbell, H. Tang, **L. Willingale**, *BP11.00062: Investigating Self-Induced Relativistic Transparency in Plasmas with Ultrafast High Intensity Laser Pulses*

26. A. M. Maksimchuk, J. Nees, G. Kalinchenko, B. Hou, Y. Ma, A. McKelvey, T. Shi, P. T. Campbell, A. F. Antoine, M. Balcazar, J. A. Cardarelli, N. Ernst, R. Fitzgarrald, C. Graham, Q. Qian, I. Jovanovic, C. C. Kuranz, A. G. Thomas, **L. Willingale**, K. Krushelnick, *BP11.00065: Status report on the construction of Zettawatt-Equivalent Ultrashort pulse laser System (ZEUS) at the University of Michigan*

27. H. Chen, M. R. Edwards, G. Fiksel, S. Jiang, J. Von Der Linden, A. Longman, J. L. Peebles, **L. Willingale**, *JO05.00005: Progress on Laser-Driven MeV Electron-Positron Pair Experiments*

28. B. K. Russell, P. T. Campbell, M. Vranic, K. M. Schoeffler, D. A. Uzdensky, Q. Qian, J. A. Cardarelli, A. G. Thomas, **L. Willingale**, *JO05.00009: Generation and measurement of extreme magnetic fields*

29. J. A. Cardarelli, Y. Ma, P. T. Campbell, A. F. Antoine, M. Berboucha, R. Fitzgarrald, R. C. Hollinger, B. Kettle, K. M. Krushelnick, S. P. D. Mangles, J. Morrison, R. Nedbailo, Q. Qian, J. J. Rocca, G. Sarri, D. Seipt, H. Song, M. J. V. Streeter, S. Wang, **L. Willingale**, A. G. R. Thomas, *JO05.00014: Characterizing the growth of current filamentation instability using laser wakefield accelerated beams*

30. M. J. Manuel, H. Tang, B. K. Russell, **L. Willingale**, A. M. Maksimchuk, J. Green, N. Alfonso, L. Carlson, T. Ma, *JM10.00008: Progress towards rep-rated proton imaging for use at next-generation high-energy-density (HED) science facilities*

31. R. Babjak, A. V. Arefiev, **L. Willingale**, M. Vranic, *PP11.00110: Effect of density gradient on direct laser acceleration*

32. I-L. Yin, K. Tangtartharakul, H. Rinderknecht, **L. Willingale**, A. Arefiev, *PP11.00112: Strong interplay between superluminosity and radiation friction during direct laser acceleration of electrons within a magnetic filament*

62nd Annual Meeting of the APS Division of Plasma Physics, 2020

33. VP15.00011: H. Tang, A. McKelvey, P. T. Campbell, B. K. Russell, Y. Ma, A. V. Arefiev, G. J. Williams, H. Chen, F. Albert, J. Shaw, P. M. Nilson, **L. Willingale**, *High Energy, Relativistic Intensity Laser Channeling and Direct Laser Acceleration of Electrons from an Underdense Plasma*
34. NO08.00010: G. Fiksel, H. Chen, M. R. Edwards, J. von der Linden, T. A. Link, J. Peebles, **L. Willingale**, *Laser-produced pair plasma in a magnetic mirror*
35. BO07.00004: P. T. Campbell, C. A. Walsh, A. Crilly, J. P. Chittenden, P. M. Nilson, G. Fiksel, B. K. Russell, A. G. R. Thomas, K. Krushelnick, **L. Willingale**, *Magnetic signatures of radiation-driven double ablation fronts*
36. BO07.00009: B. K. Russell, M. Vranic, P. T. Campbell, A. G. R. Thomas, K. Krushelnick, **L. Willingale**, *Magnetic field generation at extreme laser intensities*
37. CP15.00004: J. von der Linden, J. Ramos-Mendez, B. Faddegon, G. Fiksel, **L. Willingale**, J. Pebbles, J. P. Holder, M. R. Edwards, H. Chen, *Calibration of the NIF Electron Positron Proton Spectrometers (NEPPS) for Intense Laser Solid Interactions*
38. VP15.00002: A. Maksimchuk, J. Nees, G. Kalinchenko, B. Hou, Y. Ma, A. McKelvey, T. Shi, I. Jovanovic, C. Kuranz, A. G. R. Thomas, **L. Willingale**, K. Krushelnick, *ZEUS: A National Science Foundation Mid-Scale User Facility for Laser-Driven Science in the QED Regime*
39. VP15.00005: B. Stassel, B. K. Russell, P. T. Campbell, H. Tang, A. Maksimchuk, **L. Willingale**, *Investigating Self-Induced Relativistic Transparency in Plasmas with Ultrafast High Intensity Laser Pulses*

61st Annual Meeting of the APS Division of Plasma Physics, 2019

40. YP10.00049: A. Maksimchuk, I. Jovanovic, G. Kalinchenko, C. Kuranz, J. Nees, A. G. R. Thomas, **L. Willingale**, K. Krushelnick, *Zettawatt-Equivalent Ultrashort Pulse Laser System (ZEUS) at the University of Michigan*
41. CO8.00003: P. T. Campbell, C. A. Walsh, J. Chittenden, P. M. Nilson, A. G. R. Thomas, K. Krushelnick, **L. Willingale**, *Direct observation of target material effects on high power laser-driven magnetic field generation*
42. CP10.00060: B. K. Russell, P. T. Campbell, K. Krushelnick, G. Fiksel, P. M. Nilson, **L. Willingale** *Interaction of relativistic magnetized electrons with obstacles*
43. PO4.00008: G. J. Williams, H. Chen, A. Link, M. Sherlock, G. Fiksel, F. Fiuza, E. d'Humiéres, D. Kalantar, A. Kemp, S. Kerr, J. Kim, T. Ma, A. Mackinnon, A. MacPhee, M. Manuel, D. Mariscal, D. Martinez, B. Remington, M. Nakai, **L. Willingale**, *Developing a high-intensity laser-plasma experimental capability for the Pair Plasma Discovery Science campaign on NIF-ARC*
44. TP10.00065: H. Tang, B. K. Russell, A. Maksimchuk, P. T. Campbell, M. J.-E. Manuel, **L. Willingale**, *Characterizing the spatial resolution of scintillators for imaging applictions of laser-driven proton beams*

60th Annual Meeting of the APS Division of Plasma Physics, 2018

45. BO4.00006: P. T. Campbell, G. Fiksel, C. Mileham, P. M. Nilson, A. G. R. Thomas, **L. Willingale**, K. Krushelnick, *Proton radiography of a highly asymmetric laser-driven magnetic reconnection geometry*
46. NP11.00015: B. K. Russell, P. R. Kordell, A. G. R. Thomas, **L. Willingale**, *Multiple species laser-driven ion-shock acceleration*

47. NP11.00016: A. M. Maksimchuk, B. K. Russell, P. R. Kordell, G. Fiksel, A. G. R. Thomas, K. Krushelnick, **L. Willingale**, *High-intensity laser-driven electron beam and radiation generation from an underdense plasma in an axial magnetic field*

48. NP11.00020: P. R. Kordell, P. T. Campbell, B. K. Russell, A. M. Maksimchuk, K. Krushelnick, **L. Willingale**, *High intensity laser interactions with near critical density target for shock ion acceleration*

49. UO6.00009: D. Kalantar, H. Chen, G. J. Williams, D. Alessi, M. Hermann, A. G. MacPhee, D. Martinez, ARC team, M. Manuel, F. Fiuza, **L. Willingale**, J. Kim, F. N. Beg, M. Nakai, *Commissioning and use of ARC for pair-plasma generation on NIF*

59th Annual Meeting of the APS Division of Plasma Physics, 2017

50. BO5.00002: A. Hussein, T. Batson, A. V. Arefiev, H. Chen, R. S. Craxton, A. Davies, D. H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P. M. Nilson, W. Theobald, T. Wang, G. J. Williams, **L. Willingale** *Influence of plasma density on the generation of 100's MeV electrons via Direct Laser Acceleration*

51. NO6.00006: P. T. Campbell, A. Raymond, C. A. J. Palmer, Y. Ma, H. Chen, Y. Katzir, C. Mileham, P. M. Nilson, C. P. Ridgers, A. G. R. Thomas, E. R. Tubman, M. S. Wei, G. J. Williams, N. Woolsey, **L. Willingale**, K. Krushelnick, *Proton radiography of relativistic magnetic reconnection driven by ultra-high intensity lasers*

52. TP11.00045: K. Krushelnick, P. Kordell, A. Maksimchuk, A. Hussein, A. G. R. Thomas, **L. Willingale**, C. Zulick, P. M. Nilson, C. Stoeckl, R. S. Craxton, *Ion acceleration and neutron production from intense laser interactions with underdense plasmas using OMEGA EP*

53. GO5.00010: P. Kordell, P. T. Campbell, A. Maksimchuk, **L. Willingale**, K. Krushelnick, *Near-critical density target experiments for ion acceleration using high-intensity laser pulses*

58th Annual Meeting of the APS Division of Plasma Physics, 2016

54. NP10.00096: P. T. Campbell, A. Raymond, A. McKelvey, A. Maksimchuk, J. Nees, V. Yanovsky, K. Krushelnick, C. F. Dong, W. Fox, C. Zulick, M. S. Wei, H. Chen, V. Chvykov, C. Mileham, P. M. Nilson, C. Stoeckl, A. G. R. Thomas, **L. Willingale**, *Relativistic magnetic reconnection driven by intense lasers in preformed plasma*

55. GP10.00028: A. E. Hussein, T. Batson, K. Krushelnick, **L. Willingale**, A. V. Arefiev, T. Wang, P. M. Nilson, D. Froula, D. Haberberger, A. Davies, W. Theobald, J. Williams, H. Chen, *PIC Simulations of direct laser accelerated electron from underdense plasmas using the OMEGA EP Laser*

56. JO6.00001: T. Batson, A. Raymond, A. Hussein, K. Krushelnick, **L. Willingale**, P. Nilson, D. Froula, D. Haberberger, A. Davies, W. Theobald, J. Williams, H. Chen, A. Arefiev, *High Energy Electron Acceleration from Underdense Plasma Channeling Using the OMEGA EP Laser*

57. NP10.00093: P. Kordell, P. T. Campbell, A. Maksimchuk, **L. Willingale**, K. Krushelnick, *Critical Density Target Design for Ion Acceleration on the T-Cubed Laser*

57th Annual Meeting of the APS Division of Plasma Physics, 2015

58. UP12.00077: P. K. Campbell, P. R. Kordell, M. LeDuc, A. Maksimchuk, K. Krushelnick, **L. Willingale**, *Tabletop laser driven shock-ion acceleration in near-critical plasmas*

59. GP12.00009: T. Batson, A. Raymond, K. Krushelnick, **L. Willingale**, P. Nilson, D. Froula, D. Haberberger, A. Davies, W. Theobald, J. Williams, H. Chen, A. Arefiev, *High Energy Electron Acceleration from Underdense Plasmas with the OMEGA EP Laser*

60. GP12.00043: P. Kordell, P. T. Campbell, **L. Willingale**, A. Maksimchuk, K. Krushelnick, E. Tubman, N. Woolsey, *Proton Probing using the T-Cubed Laser*

61. JO7.00010: A. Raymond, A. McKelvey, C. Zulick, D. Chuanfei, A. Maksimchuk, A. G. R. Thomas, V. Yanovsky, K. Krushelnick, **L. Willingale**, V. Chykov, P. Nilson, H. Chen, G. Williams, A. Bhattacharjee, W. Fox, *Measurements of Fast Magnetic Reconnection Driven by Relativistic Electrons*

56th Annual Meeting of the APS Division of Plasma Physics, 2014

62. CP8.00056: P. Kordell, **L. Willingale**, A. Maksimchuk, K. Krushelnick, E. Tubman, N. Woolsey, *Proton probing using a "table-top-terawatt" laser*

63. NP8.00101: A. Maksimchuk, P. Belancourt, P. Kordell, M. J.-E. Manuel, **L. Willingale**, A. G. R. Thomas, R. P. Drake, K. Krushelnick, A. Brantov, V. Yu Bychenkov, *Guiding of high-energy electrons in high-intensity-laser interactions with wire targets through surface wave excitation*

64. NP8.00106: C. Zulick, A. Raymond, A. McKelvey, **L. Willingale**, V. Chvykov, A. Maksimchuk, A. G. R. Thomas, V. Yanovsky, K. Krushelnick, *Mass Limited Target Effects on Proton Acceleration with Femtosecond Laser Plasma Interactions*

65. NP8.00111: A. Raymond, A. McKelvey, C. Zulick, A. Maksimchuk, A. G. R. Thomas, **L. Willingale**, V. Chvykov, V. Yanovsky, K. Krushelnick, *X-Ray Imaging of Ultrafast Magnetic Reconnection Driven by Relativistic Electrons*

55th Annual Meeting of the APS Division of Plasma Physics, 2013

66. NP8.00074: A. Raymond, C. Zulick, P. Cummings, F. Dollar, V. Chvykov, **L. Willingale**, V. Yanovsky, A. Maksimchuk, A. G. R. Thomas, K. Krushelnick, *Investigating the influence of overdense plasma surfaces in high harmonic generation from high-intensity laser irradiation*

67. PO6.00005: A. Maksimchuk, P. Belancourt, M. J.-E. Manuel, **L. Willingale**, A. G. R. Thomas, R. P. Drake, K. Krushelnick, A. V. Brantov,V. Yu Bychenkov, *Study of surface current confinement in high-intensity laser interactions with wire targets*

68. PO6.00012: C. Zulick, F. Dollar, A. Raymond, **L. Willingale**, V. Chvykov, G. Kalintchenko, A. Maksimchuk, A. G. R. Thomas, V. Yanovsky, K. Krushelnick, *Absorption in Temporally Clean Ultra-Intense Laser Plasma Interactions*

54th Annual Meeting of the APS Division of Plasma Physics, 2012

69. NO7.00011: C. Zulick, F. Dollar, **L. Willingale**, V. Chvykov, G. Kalintchenko, A. Maksimchuk, A. G. R. Thomas, V. Yanovsky, K. Krushelnick, *Neutron Generation through Ultra-Intense Laser Plasma Interactions*

70. PP8.00091: F. Yu, A. Raymond, C. Zulick, **L. Willingale**, K. Krushelnick, A. Maksimchuk, G. Petrov, J. Davis, *Paramount Deuteron Acceleration Using High-Intensity Short Laser Pulses*

71. PP8.00092: A. Raymond, A. Maksimchuk, V. Chvykov, F. Dollar, **L. Willingale**, V. Yanovsky, F. Yu, C. Zulick, K. Krushelnick, J. Davis, G. Petrov, *Directional, energetic neutron generation via high-intensity laser/plasma interactions at CUOS*

53rd Annual Meeting of the APS Division of Plasma Physics, 2011

72. BP9.00129: A. Morace, T. Bartal, **L. Willingale**, J. Kim, A. Maksimchuk, K. Krushelnick, M. Wei, B. Paradkar, D. Batani, N. Piovella, R. Stephens, F. Beg, *Conversion Efficiency Enhancement for Laser Generated Protons in Reduced Mass Targets*

73. BP9.00133: A. Maksimchuk, F. Dollar, **L. Willingale**, G. M. Petrov, V. Chvykov, G. Kalinchenko, V. Yanovsky, C. Zulick, J. Davis, A. G. R. Thomas, K. Krushelnick, *Directional Neutron Beams Using High-Intensity Ultrashort Laser Pulses*

74. JO6.00002: S. Ivancic, W. Theobald, P. M. Nilson, S. X. Hu, D. D. Meyerhofer, C. Stoeckl, **L. Willingale**, *Initial Channeling Studies of a kJ-Class Laser in Long-Scale-Length Plasmas*

75. NO7.00014: F. Dollar, C. Zulick, S. S. Bulanov, V. Chvykov, G. Kalintchenko, T. Matsuoka, C. McGuffey, A. G. R. Thomas, **L. Willingale**, V. Yanovsky, A. Maksimchuk, K. Krushelnick, G. Petrov, J. Davis, *Circular polarization effects in ion acceleration from high intensity, short pulse laser interactions*

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76. GP9.00005: R. Leon, S. S. Bulanov, F. Dollar, **L. Willingale**, V. Chvykov, G. Kalinchenko, A. G. R. Thomas, V. Yanovsky, K. Krushelnick, A. Maksimchuk, J. Davis, G. M. Petrov, W. Nazarov, *Ion acceleration from near-critical density aerogel and foam targets*

77. JP9.00113: G. Petrov, **L. Willingale**, J. Davis, T. Petrova, A. Maksimchuk, K. Krushelnick, *The impact of contaminants on laser-driven ion acceleration in the TNSA regime*

78. XO6.00001: L. Gao, P. M. Nilson, W. Theobald, C. Stoeckl, C. Dorrer, T. C. Sangster, D. D Meyerhofer, **L. Willingale**, K. Krushelnick, *Measurements of Proton Generation with Intense, Kilojoule Laser Pulses on OMEGA EP*

79. XO6.00003: F. Dollar, T. Matsuoka, C. McGuffey, S.S. Bulanov, V. Chvykov, G. Kalinchenko, A.G.R. Thomas, **L. Willingale**, V. Yanovsky, A. Maksimchuk, K. Krushelnick, G. Petrov, J. Davis, *Narrow energy spread proton and ion spectra from high-intensity laser interactions*

80. XO6.00008: A. Maksimchuk, **L. Willingale**, T. Matsuoka, A. G. R. Thomas, K. Krushelnick, G. M. Petrov, J. Davis, V. M. Ovchinnikov, R. R. Freeman, A. Joglekar, C. D. Murphy, L. Van Woerkom, *Laser-driven neutron production from bulk and pitcher-catcher targets*

50th Annual Meeting of the APS Division of Plasma Physics, 2008

81. GO4.00015: S. R. Nagel, C. Bellei, S. Kneip, S. P. D. Mangles, C. Palmer, **L. Willingale**, A. E. Dangor, Z. Najmudin, R. J. Clarke, R. Heathcote, A. Henig, J. Schreiber, A. Saevert, M. Kaluza, *Electron Acceleration from the Interaction of VULCAN 100TW Laser with Au Foils and its Dependence on Laser Polarisation*

49th Annual Meeting of the APS Division of Plasma Physics, 2007

83. JO6.00012: C. Bellei, S. Nagel, **L. Willingale**, S. Kneip, S. P. D. Mangles, A. E. Dangor, Z. Najmudin, K. Krushelnick, S. Kar, B. Dromey, K. Markey, P. Simpson, M. Zepf, R. J. Clarke, J. Green, D. Neely, P. Norreys, D. Carroll, P. McKenna, *Studies of Electron Transport Via Transition Radiation*

48th Annual Meeting of the APS Division of Plasma Physics, 2006

84. CO3.00012: P. Nilson, **L. Willingale**, M. Kaluza, C. Kamberides, M. Wei, P. Fernandes, R. Kingham, Z. Najmudin, M. Haines, B. Dangor, K. Krushelnick, S. Minardi, M. Tatarakis, M. Notley, S. Bandyopadhyay, M. Sherlock, R. Evans, W. Rozmus, *Magnetic reconnection and plasma dynamics in two beam laser-solid interactions*

47th Annual Meeting of the APS Division of Plasma Physics, 2005

85. KO3.00008: P. Nilson, **L. Willingale**, M. Kaluza, C. Kamberidis, M. S. Wei, Z. Najmudin, R. G. Evans, A. E. Dangor, K. Krushelnick, *Self-generated magnetic field distributions in multiple-beam produced plasmas*

Seminars and Colloquia

1. Ultrafast from coast to coast, Seminars of the Canadian Ultrafast Community, 22nd June 2023
   Exploring extreme plasma physics with multi-Petawatt laser pulses
2. Laboratory for Laser Energetics (LLE) Research Review, 23rd March 2023
   The ZEUS 3 PW laser facility and High Field Science
3. Applied Physics Seminar, University of Michigan, Ann Arbor, 16th November 2022
   High-intensity laser-plasma interactions: the relativistic regime and beyond
4. LLNL High Energy Density Science (HEDS) seminar (virtual), 17th December 2020
   Magnetic signatures of radiation-driven double ablation fronts
5. Journal of Plasma Physics colloquium (virtual), 4th November 2020
   Magnetic signatures of radiation-driven double ablation fronts
6. LANL Colloquium (virtual), Los Alamos, 13th August 2020
   Magnetic signatures of radiation-driven double ablation fronts
7. CIPS (Center for Integrated Plasma Studies) seminar (virtual), University of Colorado, 8th May 2020
   Magnetic field generation and dynamics driven by relativistic intensity laser-plasma interactions
8. Applied Physics Seminar, University of Michigan, Ann Arbor, 2nd October 2019
   High-intensity laser-plasma interactions: the relativistic regime and beyond
9. Technical talk KLA patent celebration, Milpitas, CA, 25th September 2019
   Laser-Plasma Wizardry: Tricks to generate extreme radiation sources
10. AAOSA/OSUM Seminar, University of Michigan, Ann Arbor, 6th December 2018
    Using Relativistic Intensity Laser Pulses to Generate Huge Magnetic Fields and a Magnetic Reconnection Geometry
11. Atomic Physics seminar, Lund University, Lund, Sweden, 6th April 2017
    Relativistic magnetic reconnection in the laboratory
12. Plasma Physics seminar, Imperial College London, 7th July 2016
    Relativistic magnetic reconnection in the laboratory
13. Physics department colloquium, Lancaster University, 2nd November 2015
    Electron Heating and Relativistic Transparency in Laser-Driven Ion Acceleration
14. Applied Physics seminar, University of Michigan, MI, 22nd October 2014
    Relativistic-intensity Laser-Plasma Interactions
15. ECE and NERS seminar, University of Michigan, MI, 31st March 2014
    Driving Relativistic Mega-Amp Currents using Lasers
16. Plasma physics seminar, University of California, Irvine, CA, 4th March 2014
    Relativistic laser-plasma interactions: Channeling and electron heating
17. Plasma physics seminar, Imperial College London, 31st January 2014
    Interaction of relativistic laser pulses with near-critical density plasma
18. Physics department seminar, University of Rochester, NY, 14th December 2012
    Relativistic laser-plasma interactions and proton probing on Omega EP
19. NERS Colloquium, University of Michigan, MI, 6th April 2012
    Experiments using the high-intensity Omega EP laser system

20. Seminar, LLNL, CA, 26th January 2012
High-intensity laser plasma interaction research at the Center for Ultrafast Optical Science

21. Plasma seminar, UCLA, CA, 21st October 2011
Ion acceleration from high-intensity laser interactions with underdense and near-critical plasma

22. CUOS Symposium on Relativistic and Non-relativistic Intensity Lasers and Applications, University of Michigan, MI, 28th September 2011
High-power, kilojoule class laser channeling, surface wave generation and particle acceleration from underdense and near critical density plasma

23. CUOS seminar, University of Michigan, MI, 29th October 2010
High-power, kilojoule class laser channeling in millimeter scale underdense plasma

24. CUOS seminar, University of Michigan, MI, 26th September 2008
Ion acceleration from underdense to near-critical density plasma

25. CUOS Symposium on Relativistic and Non-relativistic Intensity Lasers and Applications, University of Michigan, MI, October 2008
Proton acceleration from relativistically transparent plasmas

26. Plasma Physics Group seminar, Imperial College London, 10th May 2006
Forward ion acceleration from VULCAN Petawatt interactions with underdense plasma

27. Seminar, IST Lisbon, Portugal, 13th February 2006
Forward ion acceleration from VULCAN Petawatt interactions with underdense plasma

28. Plasma Physics Group seminar, Imperial College London, 22nd June 2005
Ion acceleration from underdense plasma with the VULCAN Petawatt laser

29. Plasma Physics Group seminar, Imperial College London, 26th May 2004
Ions from Petawatt laser interactions with underdense plasma

Technical Reports

1. J. P. Palastro, F. Albert, B. Albright, T. Antonsen Jr., A. Arefiev, J. W. Bates, R. L. Berger, J. Bromage, E. M. Campbell, T. Chapman, E. Chowdhury, A. Colaïtis, C. Dorrer, E. Esarey, F. Fiúza, N. Fisch, R. K. Follett, D. H. Froula, S. H. Glenzer, D. Gordon, D. Haberberger, B. M. Hegelich, T. Jones, D. Kaganovich, K. Krushelnick, P. Michel, H. Milchberg, J. Moloney, W. Mori, J. F. Myatt, P. M. Nilson, S. P. Obenschain, J. L. Peebles, J. Peñano, M. Richardson, H. G. Rinderknecht, J. Rocca, A. J. Schmitt, C. Schroeder, J. L. Shaw, L. O. Silva, D. Strozzi, S. Suckewer, A. Thomas, F. Tsung, D. Turnbull, D. Umstadter, J. Vieira, J. Weaver, M. S. Wei, S. C. Wilks, **L. Willingale**, L. Yin, and J. D. Zuegel, *Laser-Plasma Interactions Enabled by Emerging Technologies*, LLE 2019 Annual Report, p75, DOE/NA/3856-1529 (2020)

2. K. Krushelnick, P. T. Campbell, **L. Willingale**, G. Fiksel, P. M. Nilson, and C. Mileham, *Proton Radiography of a Highly Asymmetric Magnetic-Reconnection Geometry on OMEGA EP*, LLE 2018 Annual Report, p 222, DOE/NA/1944-1450 (2019)

3. A. E. Hussein, T. Batson, K. Krushelnick, **L. Willingale**, A. V. Arefiev, P. M. Nilson, D. H. Froula, R. S. Craxton, A. Davies, D. Haberberger, H. Chen, G. J. Williams, *Influence of Plasma Density on the Generation of Hundreds of MeV Electrons via Direct Laser Acceleration*, LLE 2017 Annual Report, p 218, DOE/NA/1944-1363 (2018)

4. K. Krushelnick, P. Campbell, **L. Willingale**, G. Fiksel, P. M. Nilson, C. Mileham, *X-Ray Measurements of Laser-Driven Relativistic Magnetic Reconnection Using OMEGA EP*, LLE 2017 Annual

Report, p 222, DOE/NA/1944-1363 (2018)

5. **L. Willingale**, T. Batson, A. Raymond, K. Krushelnick, P. M. Nilson, D. H. Froula, D. Haberberger, A. Davies, W. Theobald, J. G. Williams, H. Chen and A. V. Arefiev, *High-Energy Electron Beam Acceleration from Underdense Plasmas Using OMEGA EP*, LLE 2016 Annual Report, p 223, DOE/NA/1944-1314 (2017)

6. K. Krushelnick, A. Raymond, **L. Willingale**, A. Thomas, T. Batson, P. M. Nilson, C. Mileham, G. J. Williams, H. Chen, and W. Fox, *X-Ray Measurements of Laser-Driven Relativistic Magnetic Reconnection Using OMEGA EP*, LLE 2016 Annual Report, p 213, DOE/NA/1944-1314 (2017)

7. C. A. J. Palmer, Y. Ma, M. J. V. Streeter, P. T. Campbell, P. Kordell, K. Krushelnick, A. G. R. Thomas, **L. Willingale**, L. Antonelli, C. R. Ridgers, N. Woolsey, J. Halliday, E. R. Tubman, S. Lebedev, Y. Katzir, E. Montgomery, M. Notley, *Proton probing of the reconnecting magnetic fields surrounding two adjacent, high-intensity laser interactions*, Central Laser Facility Annual Report 2016-17, article 18 (2017)

8. **L. Willingale**, T. Batson, A. Raymond, K. Krushelnick, P. M. Nilson, D. H. Froula, D. Haberberger, A. Davies, W. Theobald, J. G. Williams, H. Chen and A. V. Arefiev, *High-Energy Electron Beam Acceleration from Underdense Plasmas Using OMEGA EP*, LLE 2015 Annual Report, p 229, DOE/NA/1944-1251 (2016)

9. K. Krushelnick, A. Raymond, **L. Willingale**, A. Thomas, T. Batson, P. M. Nilson, C. Mileham, G. J. Williams, H. Chen, and W. Fox, *X-Ray Measurements of Laser-Driven Relativistic Magnetic Reconnection Using OMEGA EP*, LLE 2015 Annual Report, p 223, DOE/NA/1944-1251 (2016)

10. **L. Willingale**, and K. Krushelnick, *High-Intensity Laser Interactions with Low-Density Plasmas*, NNSA Stewardship Science Academic Programs Annual, p 17, DOE/NA-0019 (2013)

11. **L. Willingale**, C. Zulick, A. Maksimchuk, K. Krushelnick, P. M. Nilson, R. S. Craxton, C. Stoeckl, T. C. Sangster, H. Chen, J. Cobble, P. Norreys, and R. H. H. Scott, *Intense Laser Interactions with Low-Density Plasma Using OMEGA EP*, LLE 2012 Annual Report, p 243, DOE/NA/28302-1092 (2013)

12. **L. Willingale**, C. Zulick, A. Maksimchuk, K. Krushelnick, P. M. Nilson, R. S. Craxton, C. Stoeckl, T. C. Sangster, H. Chen, J. Cobble, P. Norreys, and R. H. H. Scott, *Low density plasma interactions*, LLE 2011 Annual Report, p 184, DOE/NA/28302-1036 (2012)

13. **L. Willingale**, A. Maksimchuk, K. Krushelnick, P. M. Nilson, R. S. Craxton, C. Stoeckl, T. C. Sangster, J. Cobble, P. Norreys, and R. H. H. Scott, *Intense Laser Interactions with Low-Density Plasmas Using OMEGA EP*, LLE 2010 Annual Report, p 243, DOE/NA/28302-985 (2011)

14. F. Dollar, T. Matsuoka, C. McGuffey, S. S. Bulanov, V. Chvykov, J. Davis, G. Kalintchenko, G. Petrov, A. G. R. Thomas, **L. Willingale**, V. Yanovsky, A. Maksimchuk, and K. Krushelnick, *Narrow Energy Spread Protons and Ions from High-Intensity, High-Contrast Laser Solid Target Interactions*, AIP Conference Proceedings Volume 1299, Advanced Accelerator Concepts: 14th Advanced Accelerator Concepts Workshop, 710 (2010)

15. **L. Willingale**, K. Krushelnick, A. Maksimchuk, P. M. Nilson, C. Stoeckl, T. C. Sangster, and W. Nazarov, *Low-Density Plasma Interactions*, LLE 2009 Annual Report, p120, DOE/NA/28302-923 (2010)

16. K. Markey, S. Kar, P. Simpson, B. Dromey, M. Zepf, C. Bellei, S. Nagel, S. Kneip, Z. Najmudin, **L. Willingale**, K. Krushelnick, J. S. Greem, P. A. Norreys, R. J. Clarke, D, Neely, D. C. Carroll, P. McKenna, and E. L. Clarke, *Divergence control of multi-MeV laser accelerated proton beams using curved foil targets*, Central Laser Facility Annual Report 2007/2008, p42

17. S. R. Nagel, C. Bellei, S. Kneip, S. P. D. Mangles, C. Palmer, **L. Willingale**, A. E. Dangor, Z. Najmudin, R. J. Clarke, R. Heathcote, B. Dromey, S. Kar, K. Markey, P. Simpson, M. Zepf, M. Kaluza, A. Savert, A. Henig, and J. Schreiber, *Electron acceleration from the interaction of Vulcan 100TW laser with Au foils and its dependence on laser polarisation*, Central Laser Facility Annual Report 2007/2008, p45

18. C. Palmer, C. Bellei, A. E. Dangor, S. Kneip, S. P. D. Mangles, S. R. Nagel, Z. Najmudin, **L. Willingale**, R. J. Clarke, R. Heathcote, A. Henig, J. Schreiber, M. C. Kaluza, and A. Savart, *Proton energy spectra from ultra-intense laser interactions with film targets of varying thickness*, Central Laser Facility Annual Report 2007/2008, p52

19. S. Kneip, S. R. Nagel, C. Bellei, **L. Willingale**, P. M. Nilson, S. P. D. Mangels, A. E. Dangor, Z. Najmudin, S. Reed, A. Maksimchuk, K. Krushelnick, K. Ta Phuoc, N. Bourgeois, A. Rousse, J. R. Marques, A. Gopal, and M. Tatarakis, *Petawatt laser synchrotron source*, Central Laser Facility Annual Report 2006/2007, p25

20. K. Markey, S. Kar, P. T. Simpson, B. Dromey, M. Zepf, C. Bellei, S. R. Nagel, S. Kneip, Z. Najmudin, **L. Willingale**, J. S. Green, P. A. Norreys, R. J. Clarke, D. Neely, D. C. Carroll, P. McKenna, E. L. Clarke, K. Krushelnick, and A. Schiavi, *Divergence reduction of laser accelerated proton beams*, Central Laser Facility Annual Report 2006/2007, p29

21. S. R. Nagel, S. P. D. Mangles, S. Kneip, C. Bellei, **L. Willingale**, A. E. Dangor, Z. Najmudin, R. J. Clarke, R. Heathcote, K. L. Lancaster, A. Gopal, M. Tatarakis, A. Maksimchuk, S. A. Reed, and K. Krushelnick, *Electron acceleration from underdense plasma with the Vulcan Petawatt laser*, Central Laser Facility Annual Report 2006/2007, p41

22. C. Bellei, S. R. Nagel, **L. Willingale**, S. Kneip, A. E. Dangor, Z. Najmudin, K. Krushelnick, S. Kar, P. T. Simpson, B. Dromey, K. Markey, M. Zepf, J. S. Green, P. A. Norreys, R. J. Clarke, D. Neely, D. C. Carroll, P. McKenna, and W. Murphy, *Optical emission from the rear side of solid targets irradiated with the Vulcan Petawatt laser*, Central Laser Facility Annual Report 2005/2006, p11

23. S. Kneip, S. R. Nagel, S. P. D. Mangles, **L. Willingale**, P. M. Nilson, A. E. Dangor, Z. Najmudin, K. Krushelnick, K. Ta Phuoc, N. Bourgeois, A. Rousse, and J. R. Marques, *X-ray radiation measurement from electron accelerated in low-density plasma Petawatt laser interaction*, Central Laser Facility Annual Report 2005/2006, p34

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25. P. M. Nilson, **L. Willingale**, M. C. Kaluza, C. Kamberidis, M. S. Wei, P. Fernandes, R. J. Kingham, Z. Najmudin, M. G. Haines, A. E. Dangor, K. Krushelnick, M. Notley, S. Bandyopadhyay, M. Sherlock, R. G. Evans, S. Minardi, M. Tatarakis, and W. Rozmus, *Magnetic reconnection and plasma dynamics in two beam laser-solid interactions*, Central Laser Facility Annual Report 2005/2006, p47

26. **L. Willingale**, S. P. D. Mangles, S. R. Nagel, C. Bellei, A. E. Dangor, M. C. Kaluza, C. Kamberidis, S. Kneip, Z. Najmudin, P. M. Nilson, A. G. R. Thomas, K. Krushelnick, R. J. Clarke, R. Heathcote, W. Nazarov, N. Lopes, and K. Marsh, *Proton acceleration from near critical density foam targets using the Vulcan Petawatt laser*, Central Laser Facility Annual Report 2005/2006, p61

27. **L. Willingale**, S. P. D. Mangles, P. M. Nilson, Z. Najmudin, M. S. Wei, A. G. R. Thomas, M. C. Kaluza, A. E. Dangor, K. Krushelnick, K. Lancaster, R. J. Clarke, C. Hernandez-Gomez, S.

J. Hawkes, P. A. Norreys, S. Karsch, J. Schreiber, and M. Tatarakis, *Initial observations of the effect on the transverse acceleration of ions and production of neutrons from underdense plasma in controlled two pulse experiments with the Vulcan Petawatt laser*, Central Laser Facility Annual Report 2004/2005, p5

28. **L. Willingale**, S. P. D. Mangles, P. M. Nilson, Z. Najmudin, M. S. Wei, A. G. R. Thomas, M. C. Kaluza, A. E. Dangor, K. Krushelnick, K. Lancaster, R. J. Clarke, S. Karsch, J. Schreiber, and M. Tatarakis, *Forward acceleration of ions from underdense plasma interactions with the Vulcan Petawatt laser*, Central Laser Facility Annual Report 2004/2005, p8

29. P. M. Nilson, S. P. D. Mangles, **L. Willingale**, M. C. Kaluza, A. G. R. Thomas, M. Tatarakis, Z. Najmudin, R. G. Evans, A. E. Dangor, K. Krushelnick, R. J. Clarke, K. L. Lancaster, S. Karsch, and J. Schreiber, *Experimental observations of blast wave formation driven by high-intensity laser interactions with underdense plasma*, Central Laser Facility Annual Report 2004/2005, p11

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