

# Publication List:

## Peer reviewed publications:

95. Gilljohann MF, Ding H, Döpp A, Götzfried J, Schindler S, Schilling G, Corde S, Debus A, Heinemann T, Hidding B, Hooker SM, Irman A, Kononenko O, Kurz T, Martinez de la Ossa A, Schramm U, **Karsch S**, **Direct Observation of Plasma Waves and Dynamics Induced by Laser-Accelerated Electron Beams**, *Physical Review X* **9**, 011046 (2019)

94. Jahn O, Leshchenko VE, Tzallas P, Kessel A, Krüger M, Münzer A, Trushin S, Tsakiris GD, Kahaly S, Kormin D, Veisz L, Pervak V, Krausz F, Major Zs, **Karsch S**, **Towards intense isolated attosecond pulses from relativistic surface high harmonics**, *Optica* **6**, 280 (2019)

93. Wenz J, Döpp A, Khrennikov K, Schindler S, Gilljohann MF, Ding H, Götzfried J, Buck A, Xu J, Heigoldt M, Helml W, Veisz L, **Karsch S**, **Dual-energy electron beams from a compact laser-driven accelerator**, *Nature Photonics* **13** 263-270 (2019)

92. Goetzfried J, Doepp A, Gilljohann M, Ding H, Schindler S, Wenz J, Hehn L, Pfeiffer F, **Karsch S**  
**Research towards high-repetition rate laser-driven X-ray sources for imaging applications**  
*Nuclear Instruments and Methods A*, 909, 286-289 (2018)

91. Williamson B, Xia G, Döbert S, **Karsch S**, Muggli P  
**Simulation Study of an LWFA-based Electron Injector for AWAKE Run 2**  
*Nuclear Instruments and Methods A*, <https://doi.org/10.1016/j.nima.2018.02.005>, 2018

90. Kurz T, Couperus JP, Kraemer JM, Ding H, Kuschel S, Koehler A, Zarini O, Hollatz D, Schinkel D, D'Arcy R, Schwinkendorf JP, Osterhoff J; Irman A; Schramm U, **Karsch S**  
**Calibration and cross-laboratory implementation of scintillating screens for electron bunch charge determination**  
*Review of Scientific Instruments* **89**, 093303 (2018)

89. Kessel A, Leshchenko V A, Jahn O, Krüger M, Münzer A, Schwarz A, Pervak V, Trubetskov M, Trushin S, Krausz F, Major Zs, **Karsch S**  
**Relativistic few-cycle pulses with high contrast from picosecond-pumped OPCPA**  
*Optica* **5**, 434 (2018)

88. Döpp A, Hehn L, Götzfried J, Wenz J, Gilljohann M, Ding H, Schindler S, Pfeiffer F, **Karsch S**  
**Quick x-ray microtomography using a laser-driven betatron source**  
*Optica* **5**, 199-203 (2018)

87. Bin J H, Allinger K, Khrennikov K, **Karsch S**, Bolton P R, Schreiber J  
**Dynamics of laser-driven proton acceleration exhibited by measured laser absorptivity and reflectivity**  
*Scientific Reports* **7**, 43548 (2017)

86. Chou SW, Xu J, Khrennikov K., Cardenas DE, Wenz J, Heigoldt M. Hofmann L, Veisz L, **Karsch S**  
**Collective deceleration of laser-driven electron bunches**  
*Phys. Rev. Lett.* **117** 144801 (2016)

85. Kuschel S, Hollatz D, Heinemann T, Karger O, Schwab MB, Ullmann D, Knetsch A, Seidel A, Rödel C, Yeung M, Leier M, Blinne A, Ding H, Kurz T, Corvan DJ, Sävert A, **Karsch S**, Kaluza MC, Hidding B, Zepf M  
**Demonstration of passive plasma lensing of a laser wakefield accelerated electron bunch**  
*Phys. Rev. Accelerators and Beams* **19** 071301 (2016)
84. Kessel A, Trushin SA, Karpowicz N, Skrobol C, Klingebiel S, Wandt C, **Karsch S**  
**Generation of multi-octave spanning high-energy pulses by cascaded nonlinear processes in BBO**  
*Optics Express* **24** 5628 (2016)
83. Heigoldt M, Bajlekov SI, Popp A, Khrennikov K, Wenz J, Chou SW, Schmidt B, Hooker SM, **Karsch S**  
**Temporal evolution of longitudinal bunch profile in a laser wakefield accelerator**  
*Phys. Rev. STAB.* **18** 1201302 (2015)
82. Wenz J, Schleede S, Khrennikov K, Bech M, Thibault P, Heigoldt M, Pfeiffer F, **Karsch S**  
**X-Ray Phase-Contrast Microtomography from a Compact Laser Driven Betatron Source**  
*Nature Communications* **6** 7568 (2015)
81. Khrennikov K, Wenz J, Buck A, Xu J, Heigoldt M, Veisz L, **Karsch S**  
**Tunable, All-Optical Quasimonochromatic Thomson X-ray Source in the Nonlinear Regime**  
*Phys. Rev. Lett.* **114** 195003 (2015)
80. Heissler P, Barna A, Mikhailova JM, Ma GJ, Khrennikov K, **Karsch S**, Veisz L, Földes IB, Tsakiris GD,  
**Multi- $\mu$ J harmonic emission energy from laser-driven plasma,**  
*Applied Phys. B* **118**, 195 (2015)
79. Fülöp JA, Ollmann Z, Lombosi Cs, Skrobol C, Klingebiel S, Palfalvi L, Krausz F, **Karsch S**, Hebling J  
**Efficient generation of THz pulses with 0.4 mJ energy**  
*Optics Express* **22**, 20155 (2014)
78. Heissler P, Lugovoy E, Hörlein R, Waldecker L, Wenz J, Heigoldt M, Khrennikov K, **Karsch S**, Krausz F, Abel B, Tsakiris GD  
**Using the third state of matter: high harmonic generation from liquid targets**  
*New Journal of Physics* **16**, 113045 (2014)
77. Hemmers D, Behmke M, **Karsch S**, Keyling J, Major Z, Stelzmann C, Pretzler, G  
**Temporal coherence of high-order harmonics generated at solid surfaces**  
*Applied Physics B* **116** 121 (2014)
76. Wandt C, Klingebiel S, Keppler S, Hornung M, Skrobol C, Kessel A, Trushin SA, Major Zs, Hein J, Kaluza MC, Krausz F, **Karsch S**  
**Development of a Joule-class Yb:YAG amplifier and its implementation in a CPA system generating 1 TW pulses**  
*Laser & Photonics Reviews* **8**, 875 (2014)
75. Bin JH, Ma WJ, Allinger K, Wang HY, Kiefer D, Reinhardt S, Hinz P, Khrennikov K, **Karsch S**, Yan XQ, Krausz F, Tajima T, Habs D, Schreiber J  
**On the small divergence of laser-driven ion beams from nanometer thick foils**  
*Physics of Plasmas* **20**, 073113 (2013)
74. Buck A, Wenz J, Xu J, Khrennikov K, Schmid K, Heigoldt M, Mikhailova JM, Geissler M, Shen B, Krausz F, **Karsch S**, Veisz L

**Shock-Front Injector for High-Quality Laser-Plasma Acceleration**

*Physical Review Letters* **110**, 185006 (2013)

73. Walker PA, Bourgeois N, Rittershofer W, Cowley J, Kajumba N, Maier AR, Wenz J, Werle CM, **Karsch S**, Grüner F, Symes DR, Rajeev PP, Hawkes SJ, Chekhlov O, Hooker CJ, Parry B, Tang Y, Hooker SM

**Investigation of GeV-scale electron acceleration in a gas-filled capillary discharge waveguide**

*New Journal of Physics* **15** 045024 (2013)

72. Bajlekov SI, Heigoldt M, Popp A, Wenz J, Khrennikov K, **Karsch S**, Hooker SM

**Longitudinal electron bunch profile reconstruction by performing phase retrieval on coherent transition radiation spectra**

*Physical Review Special Topics – Accelerators and Beams* **16**, 040701 (2013)

71. Bourgeois N, Heigoldt M, Rittershofer W, Popp A, Khrennikov K, Bajlekov SI, **Karsch S**, Hooker SM

**Transverse Beam Profile Measurement of Laser Accelerated Electrons using Coherent Optical Radiation**

*AIP Conf. Proc.* **1507**, 258 (2012)

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**A laser-driven nanosecond proton source for radiobiological studies**

*Applied Physics Letters* **101**, 243701 (2012)

69. Weingartner R, Raith S, Popp A, Chou S, Wenz J, Khrennikov K, Heigoldt M, Maier AR, Kajumba N, Fuchs M, Zeitler B, Krausz F, **Karsch S**, Grüner F

**Ultralow emittance electron beams from a laser-wakefield accelerator**

*Physical Review Special Topics – Accelerators and Beams* **15**, 111302 (2012)

68. Heissler P, Tzallas P, Mikhailova JM, Khrennikov K, Waldecker L, Krausz F, **Karsch S**, Charalambidis D, Tsakiris GD

**Two-photon above-threshold ionization using extreme-ultraviolet harmonic emission from relativistic laser-plasma interaction**

*New Journal of Physics* **14** 043025 (2012)

67. Fülöp JA, Palfalvi L, Klingebiel S, Almasi G, Krausz F, **Karsch S**, Hebling J

**Generation of sub-mJ terahertz pulses by optical rectification**

*Optics Letters* **37**, 557-559 (2012)

66. Skrobol C, Ahmad I, Klingebiel S, Wandt C, Trushin SA, Major Zs, Krausz F, **Karsch S**

**Broadband amplification by picosecond OPCPA in DKDP pumped at 515 nm**

*Optics Express* **20**, 4619-4629 (2012)

65. Klingebiel S, Ahmad I, Wandt C, Skrobol C, Trushin SA, Major Zs, Krausz F, **Karsch S**

**Experimental and theoretical investigation of timing jitter inside a stretcher-compressor setup**

*Optics Express* **20**, 3443-3455 (2012)

64. Waldecker L, Heissler P, Hörlein R, Allinger K, Heigoldt M, Khrennikov K, Wenz J, **Karsch S**, Krausz F, Tsakiris GD

**Focusing of high order harmonics from solid density plasmas**

*Plasma Physics and Controlled Fusion* **53**, 124021 (2011)

63. Ahmad I, Berge L, Major Zs, Krausz F, **Karsch S**, Trushin SA

Redshift of few-cycle infrared pulses in the filamentation regime  
*New Journal of Physics* **13**, 093005 (2011)

62. Zherebtsov S, Fennel T, Plenge J, Antonsson E, Znakovskaya I, Wirth A, Herrwerth O, Süssmann F, Peltz C, Ahmad I, Trushin SA, Pervak V, **Karsch S**, Vrakking MJJ, Langer B, Graf C, Stockman MI, Krausz F, Rühl E, Kling MF

Controlled near-field enhanced electron acceleration from dielectric nanospheres with intense few-cycle laser fields  
*Nature Physics* **7**, 656 (2011)

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Density measurement in a laser-plasma-accelerator capillary using Raman scattering  
*Physical Review Special Topics – Accelerators and Beams* **14** 050705 (2011)

60. Weingartner R, Fuchs M, Popp A, Raith S, Becker S, Chou S, Heigoldt M, Khrennikov K, Wenz J, Seggebrock T, Zeitler B, Major Zs, Osterhoff J, Krausz F, **Karsch S**, Grüner F  
Imaging laser-wakefield-accelerated electrons using miniature magnetic quadrupole lenses  
*Physical Review Special Topics – Accelerators and Beams* **14** 052801 (2011)

59. Klingebiel S, Wandt C, Skrobol C, Ahmad I, Trushin SA, Major Zs, Krausz F, **Karsch S**  
High energy picosecond Yb:YAG CPA system at 10 Hz repetition rate for pumping optical parametric amplifiers  
*Optics Express* **19**, 5357 (2011)

58. Popp A, Vieira J, Osterhoff J, Major Zs, Hörlein R, Fuchs M, Weingartner R, Rowlands-Rees TP, Marti M, Fonseca RA, Martins SF, Silva LO, Hooker SM, Krausz F, Grüner F, **Karsch S**  
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*Physical Review Letters* **105**, 215001 (2010)

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Simulations of petawatt-class few-cycle optical-parametric chirped-pulse amplification, including nonlinear refractive index effects  
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Ultra-broadband near-infrared pulse generation by noncollinear OPA with angular dispersion compensation  
*Applied Physics B* **100**, 207 (2010)

55. Hidding B, Königstein T, Osterholz J, **Karsch S**, Willi O, Pretzler G  
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*Physical Review Letters* **104**, 195002 (2010)

54. Nilson PM, Mangles SPD, Willingale L, Kaluza MC, Thomas AGR, Tatarakis M, Clarke RJ, Lancaster KL, **Karsch S**, Schreiber J, Najmudin Z, Dangor AE, Krushelnick K  
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*New Journal of Physics* **12**, 045014 (2010)

53. Hörlein R, Nomura Y, Tzallas P, Rykovanov SG, Dromey B, Osterhoff J, Major Zs, **Karsch S**, Veisz L, Zepf M, Charalambidis D, Krausz F, Tsakiris GD  
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*New Journal of Physics* **12**, 043020 (2010)

52. Buck A, Zeil K, Popp A, Schmid K, Jochmann A, Kraft SD, Hidding B, Kudyakov T, Sears CMS, Veisz L, **Karsch S**, Pawelke J, Sauerbrey R, Cowan T, Krausz F, Schramm U  
Absolute charge calibration of scintillating screens for relativistic electron detection

*Review of Scientific Instruments* **81**, 033301 (2010)

51. Debus AD, Bussmann M, Schramm U, Sauerbrey R, Murphy CD, Major Zs, Hörlein R, Veisz L, Schmid K, Schreiber J, Witte K, Jamison SP, Gallacher JG, Jaroszynski DA, Kaluza MC, Hidding B, Kiselev S, Heathcote R, Foster PS, Neely D, Divall EJ, Hooker CJ, Smith JM, Ertel K, Langley AJ, Norreys P, Collier JL, **Karsch S**

**Electron Bunch Length Measurements from Laser-Accelerated Electrons Using Single-Shot THz Time-Domain Interferometry**

*Physical Review Letters* **104**, 084802 (2010)

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**Generation of Ultrahigh-Velocity Ionizing Shocks with Petawatt-Class Laser Pulses**

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49. Ahmad I, Trushin SA, Major Zs, Wandt C, Klingebiel S, Wang TJ, Pervak V, Popp A, Siebold M, Krausz F, **Karsch S**

**Frontend light source for short-pulse pumped OPCPA system**

*Applied Physics B* **97**, 529 (2009)

48. Fuchs M, Weingartner R, Popp A, Major Zs, Becker S, Osterhoff J, Cortrie I, Zeitler B, Hörlein R, Tsakiris GD, Schramm U, Rowlands-Rees TP, Hooker SM, Habs D, Krausz F, **Karsch S**, Grüner F

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*Physics of Plasmas* **16**, 043105 (2009)

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*Physical Review Letters* **102**, 095002 (2009)

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**Attosecond phase locking of harmonics emitted from laser-produced plasma**

*Nature Physics* **5**, 124 (2009)

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**Generation of Stable, Low-Divergence Electron Beams by Laser Wakefield Acceleration in a Steady-State-Flow Gas Cell**

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Generation of 220 mJ nanosecond pulses at a 10 Hz repetition rate with excellent beam quality in a diode-pumped Yb:YAG MOPA system  
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*Optics Express* **16**, 3674 (2008)
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Invited conference contributions:

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