



Vyacheslav Leshchenko

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EDUCATION

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| PhD in Laser Physics | with distinction Institute of Laser Physics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia. Thesis title: Coherent combining of parametric amplified multiterawatt femtosecond pulses in a two-channel laser setup | 2012 - 2015 |
| Master of Physics | with distinction Novosibirsk State University, Novosibirsk, Russia. Thesis title: Coherent combining of parametric amplified femtosecond pulses | 2010 - 2012 |
| Bachelor of Physics | with distinction Novosibirsk State University, Novosibirsk, Russia. Thesis title: Phase noise and timing jitter of femtosecond lasers. | 2006 - 2010 |

EMPLOYMENT HISTORY

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| Research Scientist | NeXUS attosecond facility (NSF mid-scale), The Ohio State University, Columbus, Ohio, USA Developing high-power attosecond high order harmonic sources pumped with a kW-class high-repetition rate laser system and the beamlines delivering these attosecond pulses to the end-stations: ATTO/XAS/XRS, LIED, STM, ARPES. | 2021-present |
| PostDoc | DiMauro group (principal investigator: Prof. Dr. Louis DiMauro), the Department of Physics of The Ohio State University, Columbus, Ohio, USA Developing multi-mJ 2.4 μm femtosecond laser system for applications in atomic, molecular and optical physics. Pioneering a new approach for nonlinear compression of the generated mid-IR pulses to few-cycle pulse duration in a simple and compact lens-based setup. Applying these pulses to generation of water window soft-X-ray high harmonic and near-single-cycle long-wave infrared pulse with GW peak power; and to studies of ultrafast dynamics of nano-plasmas and phase-resolved attosecond transient absorption spectroscopy of atoms and molecules | 2019-present |
| PostDoc | Petawatt Field Synthesizer group (principal investigator: Prof. Dr. Stefan Karsch), Laboratory of Attosecond Physics (director: Prof. Dr. Ferenc Krausz), Max Planck Institute of Quantum Optics (starting from 01.01.2018 employed at Ludwig-Maximilian University), Munich, Germany. Commissioning (including planning and organizing a rebuild) of a unique OPCPA system (Petawatt Field Synthesizer) generating few-cycle pulses with relativistic intensity and exceptionally good temporal contrast. Planning and conducting experiments with this system on the surface high harmonics generation (SHHG). As an outcome, the possibility to generate high-energy isolated attosecond pulses via relativistic SHHG was experimentally proven. Supporting a pioneering work on nonlinear compression of femtosecond pulses on the few 100s W average power level and tens of mJ energy level in a multi-pass cell | 2015 - 2019 |

TEACHING EXPERIENCE

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| Reorganizing and coordinating the laboratory course on electrodynamics and optics for 3d and 4th semester students at the Department of Physics, Novosibirsk State University, Novosibirsk, Russia. | 2011-2012 |
| Teaching assistant at the course “Principles of Lasers” PHYSICS 6804.20 (which involves regular teaching problem solving classes and occasionally substituting the lecturer), at the Department of Physics of The Ohio State University, Columbus, Ohio, USA | 2020 |

AWARDS AND HONORS

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| Post-Doctoral fellowship of the Max-Planck Society (Germany) | 2015-2017 |
| Fellowship of the Russian Federal Research Council for outstanding PhD students | 2014-2015 |
| Scholarship of the Department of Physics of the Novosibirsk State University for outstanding students | 2011-2012 |

SKILLS

High harmonics generation and characterization, design of ultrafast laser systems, post-compression (nonlinear compression), OPCPA/OPA, ultrafast laser diagnostics, relativistic laser-plasma and strong field laser-matter interactions, electron and ion time of flight spectrometers, XUV and soft X-ray spectrometers, laser stabilization and synchronization, CPA stretchers and compressors, broadband oscillators and amplifiers, high-vacuum and ultra-high-vacuum apparatus, control and data acquisition systems, high-speed electronics.

Languages: Russian – native speaker; English – advanced level; German – good; Spanish – beginner

Software and programming languages: Python, C/C++, Mathematica, LabView, CAD (Inventor), MATLAB. Experience with particle in cell simulations on a high-performance computer

Group Memberships

Optica (formerly OSA); American Physical Society (APS); American Association of Physics Teachers (AAPT)

Reviewer service

Optica (formerly OSA); IOP Publishing; The American Institute of Physics (AIP); Elsevier B.V.; Springer Nature Group

PUBLICATIONS IN PEER-REVIEWED JOURNALS:

21. T. D. Scarborough, **V. Leshchenko**, T. J. Ronningen, T. K. Allison, J. Gupta, R. Kawakami, C. Turro, L. R. Baker, and L. F. DiMauro, "National eXtreme Ultrafast Science facility: a new horizon in ultrafast science" **Nat. Rev. Phys.** in review
20. **V. Leshchenko**, Sha Li, P. Agostini, and L. F. DiMauro, "Sub-2-cycle GW-peak-power IR OPA for ultrafast nonlinear spectroscopy of condensed matter," **Optica** in review
19. **V. Leshchenko**, B. Smith, A. Camacho Garibay, L. Fang, P. Agostini, and L.F. DiMauro, "Nano-plasma resonance condition in the middle-infrared spectral range," **PRE** accepted
18. **V. Leshchenko**, S. J. Hageman, C. Cariker, G. Smith, A. Camper, B. K. Talbert, P. Agostini, L. Argenti, and L. F. DiMauro, "Kramers-Kronig relation in attosecond transient absorption spectroscopy," **Optica** 10, 142-146 (2023)
17. V. E. **Leshchenko**, B. K. Talbert, Y. H. Lai, S. Li, Y. Tang, S. J. Hageman, G. Smith, P. Agostini, L. F. DiMauro, and C. I. Blaga, "High-power few-cycle Cr:ZnSe mid-infrared source for attosecond soft x-ray physics," **Optica** 7, 981-988 (2020)
16. V. E. **Leshchenko**, A. Kessel, O. Jahn, M. Krüger, A. Münzer, S. A. Trushin, Zs. Major, and Karsch, *On-target temporal characterization of optical pulses at relativistic intensity*, **Light: Science & Applications** 8, 96 (2019)
15. O. Jahn, V. E. **Leshchenko**, P. Tzallas, A. Kessel, M. Krüger, A. Münzer, S. A. Trushin, G. D. Tsakiris, S. Kahaly, D. Kormin, L. Veisz, V. Pervak, F. Krausz, Zs. Major, and S. Karsch, "Towards intense isolated attosecond pulses from relativistic surface high harmonics," **Optica** 6, 280-287 (2019)
14. M. Kaumanns, V. Pervak, D. Kormin, V. **Leshchenko**, A. Kessel, M. Ueffing, Y. Chen and T. Nubbemeyer, *Multipass spectral broadening of 18 mJ pulses compressible from 1.3 ps to 41 fs*, **Optic Letters**, 43, 5877-5880 (2018).
13. A. Kessel, V. E. **Leshchenko**, O. Jahn, M. Krüger, A. Münzer, A. Schwarz, V. Pervak, M. Trubetskov, S. A. Trushin, F. Krausz, Zs. Major, and S. Karsch, *Relativistic few-cycle pulses with high contrast from picosecond-pumped OPCPA*, **Optica**, 5(4), 434-442 (2018)
12. S. A. Frolov, V. I. Trunov, V. E. **Leshchenko** and E. V. Pestyakov, *Multi-octave supercontinuum generation with IR radiation filamentation in transparent solid-state media*, **Applied Physics B**, 122(5), 122-124 (2016)
11. K. V. Lotov, K. V. Gubin, V. E. **Leshchenko**, V. I. Trunov, and E. V. Pestyakov, *Guiding femtosecond high-intensity high-contrast laser pulses by copper capillaries*, **Physics of Plasmas**, 22, 103111 (2015)
10. V. E. **Leshchenko**, *Coherent combining efficiency in tiled and filled aperture approaches*, **Opt. Express**, 23, 15944-15970 (2015)
9. V. E. **Leshchenko**, V. A. Vasiliev, N. L. Kvashnin, E. V. Pestyakov, *Coherent combining of relativistic-intensity femtosecond laser pulses*, **Applied Physics B**, 118(4), 511-516 (2015)
8. V. E. **Leshchenko**, V. I. Trunov, S. A. Frolov, E. V. Pestyakov, V. A. Vasiliev, N. L. Kvashnin, S. N. Bagayev, *Coherent combining of multimillijoule parametric amplified femtosecond pulses*, **Laser Physics Letters** 11, 095301 (2014)
7. S. N. Bagayev, V. E. **Leshchenko**, V. I. Trunov, E. V. Pestyakov, and S. A. Frolov, *Coherent combining of femtosecond pulses parametrically amplified in BBO crystals*, **Optics Letters**, 39(6), 1517–1520 (2014).
6. S. N. Bagayev, V. I. Trunov, E. V. Pestyakov, S. A. Frolov, V. E. **Leshchenko**, A. E. Kokh and V. A. Vasiliev, *Super-intense femtosecond multichannel laser system with coherent beam combining*, **Laser Physics**, 24, 074016 (2014).
5. V. E. **Leshchenko**, V. I. Trunov, E. V. Pestyakov and S. A. Frolov, *Aberration Free Broadband Stretcher-Compressor System for Femtosecond Petawatt Level Laser System Based on Parametric Amplification*, **Atmospheric and Oceanic Optics**, 27(6), 573-581 (2014).

4. S. N. Bagayev, V. I. Trunov, E. V. Pestryakov, V. E. **Leshchenko**, S. A. Frolov, V. A. Vasiliev, *Optimization of wide-band parametrical amplification stages of a femtosecond laser system with coherent addition of fields*, **Quantum Electronics**, 44(5), 415–425 (2014).
3. S. N. Bagayev, V. I. Trunov, E. V. Pestryakov, V. E. **Leshchenko**, S. A. Frolov, V. A. Vasiliev, *High-intensity femtosecond laser systems based on coherent combining of optical fields*, **Optics and Spectroscopy**, 115(3), 311–319 (2013).
2. S. A. Frolov, V. I. Trunov, E. V. Pestryakov, V. E. **Leshchenko**, *Influence of spatial beam inhomogeneities on the parameters of a petawatt laser system based on multi-stage parametric amplification*, **Quantum Electronics**, 43(5), 481–488 (2013)
1. V. I. Trunov, S. N. Bagayev, E. V. Pestryakov, S. A. Frolov, V. E. **Leshchenko**, A. V. Kirpichnikov, A. E. Kokh, V. V. Petrov, V. A. Vasiliev, *Ultrarelativistic laser systems based on coherent beam combining*, **AIP Conference Proceedings**, 1465, 18–22 (2012)

BOOKS AND BOOK CHAPTERS:

1. **V. E. Leshchenko**, Coherent Beam Combining as an Approach to Extend Achievable Limits of Laser Systems, chapter 2 in *Advances in Optics: Reviews*, Vol. 2 (ISBN: 978-84-697-9437-1), IFSA Publishing, S. L. (2018) (http://www.sensorsportal.com/HTML/BOOKSTORE/Advances_in_Optics_Reviews_Vol_2.htm)

CONFERENCE TALKS:

13. **V.E. Leshchenko**, S Hageman, C Cariker, G Smith, P Agostini, L Argenti, L DiMauro, *Phase-resolved XUV transient absorption spectroscopy of argon*. ATTO 8th international conference on attosecond science and technology, July 11 - 15 2022, Orlando, Florida, USA.
12. **V.E. Leshchenko**, T Scarborough, T Ronningen, L DiMauro and R Baker, *NeXUS - first US attosecond user facility*. ATTO 8th international conference on attosecond science and technology, July 11 - 15 2022, Orlando, Florida, USA.
11. **V.E. Leshchenko**, S.J. Hageman, G. Smith, A. Camper, P. Agostini, L.F. DiMauro, *Phase-resolved transient absorption XUV spectroscopy of Ar*. AttoChem Young Scientist Symposium 2021. September 14 – 17, 2021, virtual meeting.
10. **V. E. Leshchenko**, B. Smith, A. Camacho Garibay, L. Fang, P. Agostini, L. F. DiMauro, *Probing femtosecond dynamics of laser-heated noble-gas cluster explosions with NIR-wavelength-scanning technique*. DAMOP 2021, 31 May – 4 June, 2021, virtual meeting of APS Division of Atomic, Molecular and Optical Physics, United States.
9. **V. E. Leshchenko**, B. K. Talbert, Y. H. Lai, S. Li, C. I. Blaga, P. Agostini, and L. F. DiMauro, *Generation of 7 mJ, 115 fs pulses at 2.4 μm , 1 kHz from a Cr:ZnSe amplifier*, CLEO 2020, 10–15 May, 2020, Washington, DC, United States.
8. **V. E. Leshchenko**, A. Kessel, O. Jahn, M. Krüger, A. Münzer, S. A. Trushin, L. Veisz, Zs. Major, and S. Karsch, *Relativistic harmonics D-scan for on-target temporal characterization of intense optical pulses*, Ultrafast Optics XII: 6-11 October, 2019, Bol, Croatia.
7. **V. E. Leshchenko**, O. Jahn, A. Kessel, M. Krüger, A. Münzer, S. A. Trushin, G. D. Tsakiris, P. Tzallas, S. Kahaly, D. Kormin, L. Veisz, F. Krausz, Zs. Major, S. Karsch, *Towards isolated high energy attosecond pulses from relativistic high harmonics generation*, 8th conference of the international committee on ultrahigh intensity lasers ICUIL 2018: 10-14 September, 2018, Lindau, Germany.
6. **V.E. Leshchenko**, A. Kessel, M. Krueger, O. Lysov, A. Muenzer, S.A. Trushin, Zs. Major, F. Krausz, S. Karsch, *Developing picosecond-pumped OPCPA system for relativistic atto-science*, the 18th international conference on laser optics ICLO 2018, 4-8 June, 2018, St. Petersburg, Russia.
5. **V. E. Leshchenko**, A. Kessel, M. Krüger, O. Lysov, A. Münzer, S. A. Trushin, Zs. Major, F. Krausz, and S. Karsch, *Few-cycle picosecond-pumped OPCPA system for relativistic laser-matter interaction experiments*, Ultrafast optics 2017, 8-13 October, 2017, Jackson Hole, USA.
4. A. Kessel, **V. E. Leshchenko**, M. Krüger, O. Lysov, A. Münzer, A. Weigel, V. Pervak, M. Trubetskov, S. A. Trushin, Zs. Major, F. Krausz, and S. Karsch, *Broadband Picosecond-Pumped OPCPA Delivering 5 TW, Sub-7 fs Pulses with Excellent Temporal Contrast*, CLEO/Europe 2017, 25-29 June, 2017, Munich, Germany.
3. **V. E. Leshchenko**, S. N. Bagayev, V. I. Trunov, E. V. Pestryakov, S. A. Frolov, V. A. Vasiliev, *Dual-Channel Multiterawatt Laser System with Coherent Beam Combining*, 16-th international conference “Laser optics 2014”, 30 June – 4 July, 2014, St. Petersburg, Russia.

2. V. E. **Leshchenko**, V. I. Trunov, E. V. Pestryakov, S. A. Frolov, *Aberration-free broadband stretcher-compressor for femtosecond petawatt level laser system based on parametrical amplification*, XI International conference Atomic and Molecular Pulsed Lasers, 16-20 September 2013, Tomsk, Russia.
1. V. E. **Leshchenko**, S. N. Bagaev, V. I. Trunov, S. A. Frolov, E. V. Pestryakov, A. E. Kokh, V. A. Vasiliev, *High-intensity laser systems based on the coherent beam combining*, Fundamental Optical Problems 2012, 15-19 October, St. Petersburg, Russia.

INVITED TALKS:

1. V. E. **Leshchenko** *High-power mid-IR laser sources based on Cr:ZnSe amplifier and their applications*, Kansas State University Atomic, Molecular and Optical physics Seminar. November 18, 2020, Manhattan, KS, USA.

References:

1. Louis F. DiMauro.
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Note: it would be great if you let me know when letters are requested. Ferenc Krausz and Louis DiMauro are always very busy, so I can follow up with them to make sure that they have received the request (and don't skip it as a scam).