Dr. Vladislav Loktev

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Personal Data

Name:	Vladislav Loktev
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Work

10/2026 - Now	Czech Academy of Sciences, Czechia
10/2025 - 09/2026	Newcastle University, UK
05/2024 - 05/2025	University of Helsinki, Finland
09/2018 - 05/2025	Doctoral candidate, University of Turku, Department of Physics and Astronomy, Finland
01/2023 - 06/2023	Pre-Doctoral Fellow, Center for Computational Astrophysics (CCA) at Flatiron Institute, New York, USA

Education

06/2018	MSc in Astrophysics, Saint Petersburg State University Grade: 5.0/5.0, summa cum laude
09/2013–06/2018	Faculty of Mathematics and Mechanics, Department of Astronomy

Skills and experience

Languages:	English (fluent), Russian (native), Finnish (conversant)
Programming and software:	Python (incl. pytorch), Fortran, C/C++, FunC, Julia, HTML, JavaScript, LaTeX, bash, git, good vibes
Peer review experience:	MNRAS, ApJ, Galaxies

Publications and e-prints

"Breaking the symmetry: X-ray polarization from a spreading layer on a tilted weakly magnetized neutron star", **arXiv e-prints**, DOI:10.48550/arXiv.2610.31300
Bobrikova A., Veledina A., Poutanen J., **Loktev V.**, **2026**

"Pulse profile modelling of the 2024 outburst of the accreting millisecond pulsar SRGA J144459.2−604207", **Monthly Notices of the Royal Astronomical Society**, DOI:10.1093/mnras/stag1340
Dorsman B., Salmi T., Watts A. L., Ng M., Bobrikova A., Di Marco A., Galloway D. K., Guillot S., Hoogkamer M., Kini Y., La Monaca F., **Loktev V.**, Lucchini M., Malacaria C., Mao Y.-H., Papitto A., Poutanen J., **2026**

"Peering through the dip: IXPE unveils the extended scattering environment of GX 13+1", **arXiv e-prints**, DOI:10.48550/arXiv.2607.28714
Di Marco A., La Monaca F., Stella L., Nitindala A. P., Veledina A., Bobrikova A., Lai E. V., Papitto A., Pilia M., Poutanen J., Rogantini D., Bachetti M., Baglio M. C., Ballocco C., Del Monte E., Deng W., Illiano G., **Loktev V.**, Motta S., Xie F., **2026**

"The First X-Ray Polarimetry of an Eclipsing Low-mass X-Ray Binary: Serendipitous IXPE Observation of AX J1745.6 2901", **The Astrophysical Journal**, DOI:10.3847/1538-4357/ae7341
Mikušincová R., ..., **Loktev V.** (among 41 authors), ..., **2026**

"Super-Eddington Accretion Geometry: A Remarkable Stability of the Hidden Ultraluminous X-Ray Source Cygnus X-3", **The Astrophysical Journal**, DOI:10.3847/1538-4357/ae7366
Mikušincová R.,... **Loktev V.** (among 115 authors), ..., **2026**

"Pulse profile modelling of the accretion-powered millisecond pulsar SAX J1808.4−3658 using NICER data from its 2019 and 2022 outbursts", **Monthly Notices of the Royal Astronomical Society**, DOI:10.1093/mnras/staf1983
Dorsman B., Salmi T., Watts A. L., Ng M., Bobrikova A., **Loktev V.**, Poutanen J., Wilms J., **2026**

"IXPE view of the Sco-like source GX 349+2 in the normal branch", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202555647
La Monaca F., Bobrikova A., Poutanen J., Coti Zelati F., Pilia M., Veledina A., Bachetti M., **Loktev V.**, Xie F., **2025**

"Variability of X-ray polarization of Cyg X-1", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202555411
Kravtsov V., Bocharova A., Veledina A., Poutanen J., Hughes A. K., Dovčiak M., Egron E., Muleri F., Podgorny J., Svoboda J., Forsblom S. V., Berdyugin A. V., Blinov D., Bright J. S., Carotenuto F., Green D. A., Ingram A., Liodakis I., Mandarakas N., Nitindala A. P., Rhodes L., Trushkin S. A., Tsygankov S. S., Brigitte M., Di Marco A., Iacolina N., Krawczynski H., La Monaca F., **Loktev V.**, Mastroserio G., Petrucci P.-O., Pilia M., Tombesi F., Zdziarski A. A., **2025**

"The very high X-ray polarization of accreting black hole IGR J17091-3624 in the hard state", **Monthly Notices of the Royal Astronomical Society**, DOI:10.1093/mnras/staf859
Ewing M., Parra M., Mastroserio G., Veledina A., Ingram A., Dovčiak M., García J. A., Russell T. D., Baglio M. C., Poutanen J., Adegoke O., Bianchi S., Capitanio F., Connors R., Del Santo M., De Marco B., Trigo M. D., Gandhi P., Gupta M., Kang C., Kammoun E., **Loktev V.**, Marra L., Matt G., Nathan E., Petrucci P.-O., Shidatsu M., Steiner J. F., Tombesi F., Vincentelli F. M., **2025**

"Probing the polarized emission from the accretion-powered pulsar 4U 1907+09 with IXPE", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202555011
Zhou M., Ducci L., Liu H., Tsygankov S. S., Forsblom S. V., Mushtukov A. A., Suleimanov V. F., Poutanen J., Wang P., Di Marco A., Doroshenko V., La Monaca F., **Loktev V.**, Salganik A., Santangelo A., **2025**

"Exploring polarization and geometry in the X-ray pulsar 4U 1538-52", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202554151
Loktev V., Forsblom S. V., Tsygankov S. S., Poutanen J., Mushtukov A. A., Di Marco A., Heyl J., Kelly R. M. E., La Monaca F., Ng M., Ravi S., Salganik A., Santangelo A., Suleimanov V. F., Zane S., **2025**

"Parameter constraints for accreting millisecond pulsars with synthetic NICER data", **Monthly Notices of the Royal Astronomical Society**, DOI:10.1093/mnras/staf438
Dorsman B., Salmi T., Watts A. L., Ng M., Kamath S., Bobrikova A., Poutanen J., **Loktev V.**, Kini Y., Choudhury D., Vinciguerra S., Bogdanov S., Chakrabarty D., **2025**

"Modelling polarized X-ray pulses from accreting millisecond pulsars with X-PSI, using different hot spot locations and shapes", **Monthly Notices of the Royal Astronomical Society**, DOI:10.1093/mnras/staf441
Salmi T., Dorsman B., Watts A. L., Bobrikova A., Di Marco A., **Loktev V.**, Papitto A., Pilia M., Poutanen J., Rankin J., **2025**

"X-Ray Dips and Polarization Angle Swings in GX 13+1", **The Astrophysical Journal**, DOI:10.3847/2041-8213/ada7f8
Di Marco A., La Monaca F., Bobrikova A., Stella L., Papitto A., Poutanen J., Baglio M. C., Bachetti M., **Loktev V.**, Pilia M., Rogantini D., **2025**

"Probing the polarized emission from SMC X-1: The brightest X-ray pulsar observed by IXPE", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202450937
Forsblom S. V., ... **Loktev V.** (among 104 authors), ..., **2024**

"Studying geometry of the ultraluminous X-ray pulsar Swift J0243.6+6124 using X-ray and optical polarimetry", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202450696
Poutanen J., ... **Loktev V.** (among 111 authors), ..., **2024**

"Polarized radiation coming from the spreading layer of the weakly magnetized neutron stars", **arXiv e-prints**, DOI:10.48550/arXiv.2409.16023
Bobrikova A., Poutanen J., **Loktev V.**, **2024**

"Parameter constraints for accreting millisecond pulsars with synthetic NICER data", **arXiv e-prints**, DOI:10.48550/arXiv.2409.07908
Dorsman B., Salmi T., Watts A. L., Ng M., Kamath S., Bobrikova A., Poutanen J., **Loktev V.**, Kini Y., Choudhury D., Vinciguerra S., Bogdanov S., Chakrabarty D., **2024**

"Discovery of Polarized X-Ray Emission from the Accreting Millisecond Pulsar SRGA J144459.2−604207", **arXiv e-prints**, DOI:10.48550/arXiv.2408.00608
Papitto A., Di Marco A., Poutanen J., Salmi T., Illiano G., La Monaca F., Ambrosino F., Bobrikova A., Baglio M. C., Ballocco C., Burderi L., Campana S., Coti Zelati F., Di Salvo T., La Placa R., **Loktev V.**, Long S., Malacaria C., Miraval Zanon A., Ng M., Pilia M., Sanna A., Stella L., Strohmayer T., Zane S., **2024**

"Cygnus X-3 revealed as a Galactic ultraluminous X-ray source by IXPE", **Nature Astronomy**, DOI:10.1038/s41550-024-02294-9
Veledina A., ... **Loktev V.** (among 130 authors), ..., **2024**

"Ultrasoft state of microquasar Cygnus X-3: X-ray polarimetry reveals the geometry of the astronomical puzzle", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202451356
Veledina A.,... **Loktev V.** (among 20 authors), ... **2024**

"New polarimetric study of the galactic X-ray burster GX 13+1", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202450207
Bobrikova A., Di Marco A., La Monaca F., Poutanen J., Forsblom S. V., **Loktev V.**, **2024**

"Discovery of a strong rotation of the X-ray polarization angle in the galactic burster GX 13+1", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202449318

Bobrikova A., Forsblom S. V., Di Marco A., La Monaca F., Poutanen J., Ng M., Ravi S., **Loktev V.**, Kajava J. J. E., Ursini F., Veledina A., Rogantini D., Salmi T., et al., **2024**

"An IXPE-led X-Ray Spectropolarimetric Campaign on the Soft State of Cygnus X-1: X-Ray Polarimetric Evidence for Strong Gravitational Lensing", **The Astrophysical Journal**, DOI:10.3847/2041-8213/ad58e4
Steiner J. F., ... **Loktev V.**, (among 137 authors), **2024**

"Tracking the X-Ray Polarization of the Black Hole Transient Swift J1727.8–1613 during a State Transition", **The Astrophysical Journal**, DOI:10.3847/1538-4357/ad3faf
Ingram A.,... **Loktev V.** (among 124 authors)..., **2024**

"ARTPOL: Analytical ray-tracing method for spectro-polarimetric properties of accretion disks around Kerr black holes", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202347821
Loktev V., Veledina A., Poutanen J., Nättilä J., Suleimanov V. F., **2024**

"X-Ray Polarization of the Black Hole X-Ray Binary 4U 1630−47 Challenges the Standard Thin Accretion Disk Scenario", **The Astrophysical Journal**, DOI:10.3847/1538-4357/ad226e
Ratheesh A., ...**Loktev V.**, (among 115 authors), **2024**

"The X-ray polarization of the Seyfert 1 galaxy IC 4329A", **Monthly Notices of the Royal Astronomical Society**, DOI:10.1093/mnras/stad2625
Ingram A., ... **Loktev V.**, (among 108 authors)..., **2023**

"Polarized radiation from an accretion shock in accreting millisecond pulsars using exact Compton scattering formalism", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202346833
Bobrikova A., **Loktev V.**, Salmi T., Poutanen J., **2023**

"Complex variations in X-ray polarization in the X-ray pulsar LS V +44 17/RX J0440.9+4431", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202347088
Doroshenko V., ... **Loktev V.** (among 112 authors)... , **2023**

"Timing Analysis of the 2022 Outburst of the Accreting Millisecond X-Ray Pulsar SAX J1808.4-3658: Hints of an Orbital Shrinking", **The Astrophysical Journal**, DOI:10.3847/2041-8213/acad81
Illiano, G., ... **Loktev V.** (among 22 authors) ,..., **2023**

"Uncovering the geometry of the hot X-ray corona in the Seyfert galaxy NGC 4151 with IXPE", **Monthly Notices of the Royal Astronomical Society**, DOI:10.1093/mnras/stad1697
Gianolli, V. E., ... **Loktev V.** (among 109 authors) ,..., **2023**

"Polarized x-rays constrain the disk-jet geometry in the black hole x-ray binary Cygnus X-1", **Science**, DOI:10.1126/science.add5399
Krawczynski, H., ... **Loktev V.** (among 114 authors) ,..., **2022**

"Analytical techniques for polarimetric imaging of accretion flows in the Schwarzschild metric", **Astronomy and Astrophysics**, DOI:10.1051/0004-6361/202142360
Loktev V., Veledina A., Poutanen J., **2022**

"Neutron star parameter constraints for accretion-powered millisecond pulsars from the simulated IXPE data", **Astronomy & Astrophysics**, DOI: 10.1051/0004-6361/202039470
Salmi T., **Loktev V.**, Korsman K., Baldini L., Tsygankov S. S., Poutanen J., **2021**

"Oblate Schwarzschild approximation for polarized radiation from rapidly rotating neutron stars", **Astronomy & Astrophysics**, DOI: 10.1051/0004-6361/202039134

Loktev V., Salmi T., Nättilä J., Poutanen J., **2020**

Master's thesis,2018,
"Polarization properties of radiation from millisecond X-ray pulsars".

PhD's thesis, 2025,
"Analytical Techniques for X-ray Polarization Studies of Rapidly Rotating Neutron Stars and Black Holes".

Grants and Awards

2025	54000 EUR	**Post Doc Pool grant awarded by** *Finnish Academy of Science and letters* for a Post-doctoral project abroad
2022	26000 EUR	**grant awarded by** *Jenny and Antti Wihuri Foundation* for PhD project work
2020	25000 EUR	**granted scholarship** for PhD studies from the *Vilho, Yrjö and Kalle Väisälä Fund*
2020	24000 EUR	**grant awarded** by *Jenny and Antti Wihuri Foundation* for PhD project work
2013	**Winner**	All-Russian Astronomical Olympiad for high school students
2013	**Winner**	Saint Petersburg Astronomy Olympiad, international personal competition

Misc. Experience and Presentations

EAS 2025
• *"Theoretical Approaches to Modeling the Polarization from Accreting Millisecond Pulsars"* , contributed talk, and
• *"Exploring polarization and geometry in the X-ray pulsar 4U 1538-52"*, contributed talk
23-27 June, 2025, Cork, Ireland.

Relativistic Magnetospheres workshop
"Magnetically-dominated plasma turbulence in the rapid synchrotron-cooling regime", poster,
April 6-11 2025, Les Houches, France

45th COSPAR Scientific Assembly
"2 Fast 2 Curious: A Spectro-Polarimetric View into Acccretion Plasma Physics", contributed talk 13–21 July 2024, Busan, Korea

HEPRO VIII: High Energy Phenomena in Relativistic Outflows conference
"Magnetically-dominated plasma turbulence in the rapid synchrotron-cooling regime", poster,
23 - 26 October, 2023, Paris, France

South Bohemian X-ray polarisation workshop
"Efficient Polarimetric Analysis of Accretion Disks around Kerr Black Holes", contributed talk,

29 - 31 August, 2023, Cesky Krumlov, Czechia

Pre-Doctoral Program participation in the Center for Computational Astrophysics (CCA) at Flatiron Institute
"Microphysics of Macroscopic Accretion Flows", Computational astrophysics research project
30 January - 30 June, 2023, Simons Foundation, New York, USA

Nvidia DLI Workshops *Fundamentals of Deep Learning*
26 - 28 June, 2023, Flatiron Institute, New York, USA

44th COSPAR Scientific Assembly
- *"Fast track: polarimetric images of black hole accretion disks"*, oral presentation;
- *"Obtaining neutron star parameters from X-ray polarimetric data on accreting millisecond pulsars"*, substitute speaker for oral presentation

16-24 July, 2022, Athens, Greese

1st Mondragone Frontiers of Astronomy Series *"Fast polarimetric imaging of Kerr black holes using a Schwarzschild approximation"*, oral presentation
Monte Porzio Catone (Rome), Italy
18 - 20 May 2022

9th Microquasar Workshop: Celebrating over 50 years of discovery *"Signatures of strong gravity and fast motions in the polarization: exact analytical treatment"* poster
20 - 24 September 2021, Cagliari, Italy

CSC Summer School in High-Performance Computing participant,
Espoo, Finland
25 June - 4 July 2019

internship in the University of Tübingen
Tübingen, Germany
November 2018 and October 2019

14th Summer School on Modern Astrophysics participant
MIPT, Moscow, Russia 2-13 July 2018