

Vadim Munirov

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Education

Princeton University

Ph.D. in Astrophysical Sciences (Plasma Physics)

Thesis title: [Radiative Processes in Astrophysical and Laboratory Plasmas](#)

Princeton, NJ

Aug 2014 – Jul 2020

University of California, San Diego

Ph.D. student in Physics

La Jolla, CA

Sep 2013 – Jun 2014

Moscow Institute of Physics and Technology

M.Sc. in Applied Mathematics and Physics (with honors)

Thesis title: [Investigation of Interaction of Nonuniformly Charged Macroparticles](#)

B.Sc. in Applied Mathematics and Physics (with honors)

Moscow, Russia

Sep 2011 – Jun 2013

Sep 2007 – Jun 2011

Research and Work Experience

Princeton University

Visitor

Princeton, NJ

Sep 2022 – present

- Working on optimization of synchrotron radiation losses from the proposed p-B11 fusion device by phase space engineering energetic electrons of the distribution function

University of California, Berkeley

Postdoctoral Scholar, Professor Jonathan Wurtele's research group

Berkeley, CA

Aug 2020 – Sep 2022

- Analytically and numerically demonstrated how to create space-time quasicrystals in plasma by autoresonantly exciting multiphase ion-acoustic and plasma waves
- Developed and implemented ionization model for molecules, worked on parts of the code for modeling plasma grating experiments
- Supervised research projects for undergraduate students

Princeton Plasma Physics Laboratory

Research Assistant, Advisor: Nathaniel Fisch

Princeton, NJ

Aug 2014 – Jul 2020

- Quantified influence of kinetic effects on magnetic field generation in astrophysical plasmas due to radiative interaction
- Investigated the current drive and recoil effects in Bremsstrahlung absorption
- Quantified influence of plasma on cosmic microwave background (CMB)
- Developed $\text{Ly}\alpha$ Monte-Carlo radiative transfer Python code with finite correlation length turbulence (in collaboration with A.A. Kaurov from IAS)

Princeton University

Teaching Assistant

Princeton, NJ

Sep 2016/18 – Jan 2017/19

- Teaching assistant for a graduate course on "Plasma Waves and Instabilities" taught by Dr. Ilya Dodin (idodin@princeton.edu)

University of California, San Diego

Teaching Assistant

La Jolla, CA

Sep 2013 – Jun 2014

- Coordinated 20-30 undergraduate students in a physics lab; tutored semi-individually

Troitsk Institute for Innovation and Fusion Research

Research Assistant, Advisor: Anatoly Filippov

Moscow, Russia

Sep 2010 – Jun 2013

- Analytically and numerically studied interaction of dielectric macroparticles in plasma as part of Master's and Bachelor's theses while studying at Moscow Institute of Physics and Technology

Publications

[1] V.R. Munirov, L. Friedland, J.S. Wurtele, *Multiphase nonlinear electron plasma waves*, [Phys. Rev. E 106, 055201 \(2022\)](#)

- [2] **V.R. Munirov**, L. Friedland, J.S. Wurtele, *Autoresonant excitation of space-time quasicrystals in plasma*, [Phys. Rev. Research 4, 023150 \(2022\)](#), ([Editors' Suggestion](#)), ([Featured in Physics](#))
- [3] M.R. Edwards, **V.R. Munirov**, A. Singh, N.M. Fasano, E. Kur, N. Lemos, J.M. Mikhailova, J.S. Wurtele, and P. Michel, *Holographic plasma lenses*, [Phys. Rev. Lett., 128, 065003 \(2022\)](#), ([Featured in Physics](#))
- [4] **V.R. Munirov**, N.J. Fisch, *Radiation in equilibrium with plasma and plasma effects on cosmic microwave background*, [Phys. Rev. E, 100, 023202 \(2019\)](#)
- [5] **V.R. Munirov**, N.J. Fisch, *Inverse Bremsstrahlung current drive*, [Phys. Rev. E, 96, 053211 \(2017\)](#), ([Editors' Suggestion](#))
- [6] **V.R. Munirov**, N.J. Fisch, *Radiative transfer dynamo effect*, [Phys. Rev. E, 95, 013205 \(2017\)](#)
- [7] **V.R. Munirov**, A.V. Filippov, *Interaction of two dielectric macroparticles*, [J. Exp. Theor. Phys., 117, 809-819 \(2013\)](#)
- [8] **V.R. Munirov**, A.V. Filippov, *Interaction of a dielectric macroparticle with a point charge in plasma*, [J. Exp. Theor. Phys., 115, 527-534 \(2012\)](#)
- [9] **V.R. Munirov**, A.A. Kaurov, *Influence of turbulence on Lyman-alpha scattering*, [arXiv:2208.13103](#), submitted to MNRAS (2022)

Talks/Conferences/Visits

- 64th Annual Meeting of the APS Division of Plasma Physics. Spokane, WA, Oct 17–21, 2022
- Journal Club of LULI, CNRS, CEA, Sorbonne Université, École Polytechnique. Paris, France (over zoom), Sep 28, 2022
- Hebrew University of Jerusalem, Racah Institute of Physics. Jerusalem, Israel, May 10–Jun 10 and Sep 7–25, 2022
- 63rd Annual Meeting of the APS Division of Plasma Physics. Pittsburgh, PA, Nov 8–12, 2021
- CLEO: QELS Fundamental Science 2021, San Jose, CA, May 9–14, 2021
- 61st Annual Meeting of the APS Division of Plasma Physics. Fort Lauderdale, FL. Oct 21–25, 2019
- Astro Coffee Seminar, Institute for Advanced Study, Princeton, NJ. Oct 2, 2019
- Space Physics Seminar, UC Berkeley, Berkeley, CA. Sep 10, 2019
- 60th Annual Meeting of the APS Division of Plasma Physics. Portland, OR. Nov 5–9, 2018
- 59th Annual Meeting of the APS Division of Plasma Physics. Milwaukee, WI. Oct 23–27, 2017
- 58th Annual Meeting of the APS Division of Plasma Physics. San Jose, CA. Oct 31–Nov 4, 2016
- Princeton Graduate Seminar in Plasma Physics, Princeton, NJ. Nov, 2015, 2016
- Contest of Young Scientists, Engineers and Graduate Students in Memory of Academician A.P. Alexandrov, Troitsk, Russia. Feb 27, 2013
- Scientific-Coordination Session "Non-Ideal Plasma Physics". Moscow, Russia. Dec 6–7, 2012
- Moscow Institute of Physics and Technology 55th Scientific Conference. Dolgoprudny, Russia. Nov 19, 2012
- VII International Conference on Plasma Physics and Plasma Technology PPPT-7. Minsk, Belarus. Sep 17–21, 2012

Awards and Prizes

- Bronze medal: Kaggle Dstl Satellite Imagery Feature Detection (Dec 2016 - Mar 2017)
- Gold medal: WorldQuant Challenge Autumn Alphathon 2015 (Oct 2015 - Dec 2015)
- Russian Presidential Scholarship for outstanding academic and research achievements (Mar 2012 – Jun 2013)
- Scholarship of Abramov-Frolov's fund (Feb 2007 – Jun 2011)

Skills and Professional Service

Computer skills: Python, LaTeX, MS Office, exposure to C/C++, Fortran, MATLAB, AWS, Mathematica, R

Language skills: Russian (native), English (fluent), Tatar (basic)

Service: Reviewer for EPL (Europhysics Letters)