Alexander (Sasha) Philippov

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Professional Experience

Assistant Professor, University of Maryland, Department of Physics, from May 2022.

Associate Research Scientist, Flatiron Institute, CCA, September 2018 - May 2022.

Visiting Research Scholar, Princeton University, Astrophysics Department, September 2018 - August 2023.

NASA Einstein and TAC Postdoctoral Fellow, UC Berkeley, Sep 2017-Aug 2018.

Education

Ph.D. in Astrophysical Sciences, Princeton University, August 2017, PhD Advisor: Prof. Anatoly Spitkovsky.

M.A. in Astrophysical Sciences, Princeton University, 2014.

M.S. in Applied Physics & Mathematics with honors, Moscow Institute of Physics and Technology, 2012.

B.S. in Applied Physics & Mathematics with honors, Moscow Institute of Physics and Technology, 2010.

Selected Honors and Awards

Sloan Research Fellow in Physics, 2024

NASA Einstein and Theoretical Astrophysics Center postdoctoral fellowship (5 yr), UC Berkeley, 2017

Porter Ogden Jacobus Fellowship, Princeton University, 2017, "Princeton University's top honor for graduate students in their last year, awarded to one Ph.D. student in each of the four divisions (humanities, social sciences, natural sciences and engineering) whose work has exhibited the highest scholarly excellence."

NASA Earth and Space Science Fellowship, 2015

Dynasty Foundation Fellowship, 2012

Lebedev Physical Institute Nobel Prize winner V.L. Ginzburg Fellowship, 2011

Current Grant Support

PI and Deputy Director, Simons Collaboration on Extreme Electrodynamics of Compact Sources (SCEECS). Total award of $8 million, UMD's budget $495,000, from 09/01/23 – 08/31/27

PI, NSF Elements: Entity: Radiative General-Relativistic Particle-in-cell Toolkit for Extreme Plasma Astrophysics. Award: $600,000 from 09/01/23 – 08/31/26

PI, NSF Collaborative Research: Collaborative Research: WoU-MMA: Coherent radio and x-ray precursor transients to gravitational wave events: Simulations in general relativity and kinetic theory. Award: $375,000 from 09/01/23 – 08/31/26

PI, NSF Collaborative Research: WOU-MMA: Multi-Messenger Plasma Physics Center (MPPC). Award: $585,444 from 09/01/22 – 08/31/27

PI, NASA ATP: First-Principles Simulations of Black Hole magnetospheres. Award: $452,885 from 05/15/22 – 05/15/25

PI, NSF Collaborative Research: WOU-MMA: Extreme Quantum-Electrodynamic and General-Relativistic Plasma Physics. Award: $360,000 from 07/14/20 – 07/13/24

Teaching

Lecturer, NSF/APS-DPP GPAP Summer School in Plasma Physics for Astrophysicists, Spring 2023

Lecturer, PHYS 373, Mathematical Methods for Physicists, UMD, Spring 2023, 2024

Lecturer, Numerical methods in plasma physics and applications in astrophysics, CCA summer school, NY, July 2019

Lecturer, Relativistic Plasma Astrophysics, 13th Summer School of Modern Astrophysics, Moscow, Russia, July 2017

Teaching assistant, AST205: Planets in the Universe, Princeton University, Fall 2013

Teaching assistant, Introduction to Plasma Physics (undergraduate level), MIPT, Fall 2011-Spring 2012

Teacher, Correspondence School of Physics and Mathematics (high school level), MIPT, 2006-2009

Mentoring

Current undergraduate student: Aneesh Anandanatarajan.

Undergraduate students I have advised: L. Arzamasskiy (MIPT, Ph.D. at Princeton and IAS fellow, now in industry), M. Rashkovetskiy (with V. Beskin, MIPT, now graduate student at Harvard), E. Aneke (with H. Hakobyan, intern in Simons-NSBP summer program, now graduate student at Northwestern).

Current Ph.D. students: Alexander Chernoglazov, Alisa Galishnikova (co-advised with Eliot Quataert at Princeton), Siddhant Solanki, Sophia Woznichak, Shuzhe Zeng.

Graduate students I have worked with: Jordy Davelaar (now Columbia/CCA postdoc fellow), Elias Most (PCTS/IAS fellow, now faculty at Caltech), Benjamin Crinquand (MPPC fellow at Princeton; now faculty at University of Toulouse), Ashley Bransgrove (now PCTS fellow at Princeton), Ankan Sur (now postdoc at Princeton), Sophia Sanchez-Maes (continues Ph.D. studies at Harvard), Hayk Hakobyan (now postdoc at PPPL/Columbia).

Postdocs I am currently mentoring: Rostom Mbarek, Lia Hankla, Lena Popova, Koushik Chatterjee.

Postdocs I have previously mentored: Bart Ripperda (Einstein fellow at IAS, now faculty at CITA), Jens Mahlmann (now postdoc fellow at Columbia), Yajie Yuan (now faculty at Washington U in St. Louis), Libby Tolman (continues as a postdoc fellow at IAS/CCA), Vladimir Zhdankin (now faculty at UW Madison).

Scientific and departmental activities

Conference and School Organization

SOC member, Pulsar symposium, GuiYang, China, 2024

SOC member, SCEECS summer school on Plasmas in the Universe, University of Washington in St Louis, 2024

SOC member, “Fast Radio Bursts”, Flatiron Institute, Fall 2023

SOC co-chair, JSI conference “Winds in Astrophysics”, Fall 2023

SOC member, session on “Probing Energy Extraction from supermassive Black Holes”, COSPAR, Australia, 2020 (postponed due to COVID-19)

SOC member, Summer School of Modern Astrophysics, Moscow, Russia, 2016-2022

SOC member, CCA summer school "Multiscale Modeling of Astrophysical and Space Plasmas", Flatiron Institute, 2019

SOC member, General-Relativistic Particle-In-Cell Methods and Applications to Collisionless accretion on Black Holes, CCA, Flatiron Institute, 2019

SOC and LOC member, Plasma Physics of Neutron Star Mergers, CCA, Flatiron Institute, 2018

SOC and LOC member, Workshop on progress in modeling of Pulsar Physics, Princeton, February of 2015

Wunch Seminar Organizer, Princeton University, 2013

Service

Elected member-at-large of the APS Topical Group on Plasma Astrophysics (GPAP) executive committee, 2023-2026

Member of the UMD's JSI postdoctoral fellowship committee, 2022-current

Member of UMD physics department graduate admission committee, 2022-current

Member of the Flatiron Postdoctoral research fellowship committee, 2018-2021

Member of Advisory Board, Journal of Plasma Physics, 2019-2023

Refereeing for Journals and Agencies

Referee for Physical Review Letters, Physical Review D, Proceedings of the National Academy of Sciences, Monthly Notices of the Royal Astronomical Society, The Astrophysical Journal, The Astrophysical Journal Letters, Physics Uspekhi, Nature Astronomy, Nature Communications, Science Advances, Journal of Plasma Physics, Galaxies, Universe

Invited Reviewer for NASA Earth and Space Science / FINESST Fellowship (2018, 2021), Israel Science Foundation research grants (2019), Max Planck Society Partner group program (2021), Polish National Science Center (2021), NASA Heliophysics Technology and Instrument Development for Science/LNAPP (2022), Swiss National Science Foundation (2023)

Invited Talks

1. Invited talk at "Workshop on Relativistic Plasma Astrophysics", Purdue University, IN, May 2024
2. Invited colloquium at Stanford, April 2024
3. Invited talk at ECLIPSE meeting, Rochester, April 2024
4. Invited talk at CTA-Japan workshop, February 2024
5. Invited seminar at IAS, Princeton, February 2024
6. Invited colloqium at Harvard, January 2024
7. Invited talk at "Texas Symposium on Relativistic Astrophysics", Shanghai, December 2023
8. Invited talk at Troy University, December 2023
9. Invited colloquium at the University of Arizona Theoretical Astrophysics Program, November 2023
10. Invited talk at CDY Workshop on "Black Hole Flares", November 2023
11. Invited talk at "High Energy Phenomena in Relativistic Outflows" (HEPRO VIII), Paris, October 2023
12. Invited talk at "Modeling Plasmas Around Black Holes" Lorentz Center Workshop, Leiden, September 2023 (cancelled because of visa issues)
13. Invited panel discussion leader, "Fast Radio Bursts", Flatiron Institute, September 2023
14. Invited seminar at Cornell, April 2023
15. Invited colloquium at Columbia, March 2023
16. Invited panel discussion leader, Plasma Physics of EHT, Princeton, February 2023
17. Invited colloquium at Dartmouth, January 2023
18. Invited talk at Academia Sinica Institute for Astronomy & Astrophysics (ASIAA), Taiwan, January 2023
19. Invited talk at Extreme Electrodynamics of Neutron Stars and Black Holes, CCA, January 2023

20. Invited talk at a Mini-Conference at APS DPP, October 2022
21. Invited colloquium at George Washington University, October 2022
22. Invited talk at Physics in Intense Fields conference, August 2022
23. Invited discussion leader, Aspen Plasmas in Strong Gravity workshop, Aspen, July 2022
24. Invited talk at inaugural conference of the Illinois Center for Advanced Studies of the Universe, Illinois, May 2022
25. Invited plenary talk at "Workshop on Relativistic Plasma Astrophysics", Purdue University, IN, May 2022
26. Invited talk at Magnetic Reconnection conference, Monterey, May 2022
27. Invited talk at Weather and Climate on Neutron Stars Workshop, Princeton, April 2022
28. Invited talk at NANOGrav collaboration meeting, NYC, March 2022
29. Invited talk at Feebly Interacting Sectors Impact on Cosmology and Astrophysics, Mainz Institute for Theoretical Physics, March 2022
30. Invited seminar at Princeton's Gravity Initiative, December 2021
31. Invited colloquium at the University of Wisconsin-Madison, November 2021
32. Invited talk at MIT PCFS seminar, October 2021
33. Invited talk at Extremely High Intensity Laser Physics Conference, September 2021
34. Invited discussion leader at MIAPP workshop on relativistic plasma astrophysics, July 2021
35. Invited talk at European Astronomical Society meeting, June 2021
36. Invited colloquium at JSI, University of Maryland, May 2021
37. Invited colloquium at University of Colorado, Boulder, May 2021
38. Invited plenary talk at "next-generation EHT" conference, February 2021
39. Invited talk at Yaroslavl State University, January 2021
40. Invited talk at MPPC workshop, January 2021
41. Invited talk at APS DPP mini-conference, November 2020
42. Invited talk at "Understanding the Most Energetic Cosmic Accelerators: Advances in Theory & Simulation", PCTS, Princeton, October 2020
43. Invited talk at ICERM's Topical workshop "Mathematical and Computational Approaches for the Einstein Field Equations with Matter Fields", October 2020, Brown University
44. Invited "Journal of Plasma Physics Frontiers of Plasma Physics Colloquium", July 2020
45. Invited talk at "Physics of Neutron Stars 2020" international. conference, Saint-Petersburg, Russia, July 2020 (postponed due to COVID-19)
46. Invited talk at "Magnetic Reconnection International Conference", Alesund, Norway, June 2020 (postponed due to COVID-19)
47. Invited talk at ABCD workshop, Leuven, Belgium, April 2020 (cancelled due to COVID-19)
48. Invited talk at "Singularities in Fluids and Plasmas", PCTS, Princeton, March 2020 (cancelled due to COVID-19)
49. Invited colloquium at University of Maryland, MD, February 2020
50. Invited colloquium at University of California, Berkeley, CA, February 2020
51. Invited panel discussion member at Astrophysics of FRBs, Flatiron Institute, NY, February 2020

52. Invited talk at High-energy emission of pulsars, Bern, Switzerland, December 2019
53. Invited talk at GRPIC code workshop, Grenoble, France, November 2019
54. Invited talk at APS DPP mini-conference, October 2019
55. Invited talk at 12th Plasma Kinetics Working Meeting, Vienna, Austria, July 2019
56. Invited talk at Workshop on Neutron Star and Black Hole Magnetospheres, NASA Goddard, DC, June 2019
57. Invited talk at Horizon collaboration group meeting, Princeton, May 2019
58. Invited talk at Gravity Initiative lunch, Princeton, April 2019
59. Invited talk at MPIfR, Bonn, Germany, February 2019
60. Invited talk at GRAPPA colloquium, University of Amsterdam, Netherlands, February 2019
61. Invited discussion at Plasma Physics of Neutron Star Mergers, CCA, September 2018
62. Invited talk at TAPIR seminar, Caltech, CA, May 2018
63. Invited talk at "Workshop on Relativistic Plasma Astrophysics", Purdue University, IN, May 2018
64. Invited talk at Tea Time Seminar, Stanford University / KIPAC, March 2018
65. Invited talk at Astrophysics Seminar, Northwestern University, March 2018
66. Invited talk at Horizon Collaboration meeting, CCA, NY, January 2018
67. Invited talk at Cosmic Accelerators Conference, Annapolis, MD, November 2017
68. Invited talk at Einstein fellows symposium, CfA, MS, October 2017
69. Invited lectures on Relativistic Plasma Astrophysics at 13th Summer School of Modern Astrophysics, Moscow, Russia, July 2017
70. Invited talk at "Physics of Neutron Stars 2017" international conference, Saint-Petersburg, Russia, July 2017
71. Invited talk at "1st JPP Frontiers in Plasma Physics Conference", Abbazia di Spineto, Italy, May 2017
72. Invited talk at Berkeley TAC seminar, UC Berkeley, CA, November 2016
73. Invited talk at Goddard pulsar workshop, Washington, DC, June 2016
74. Invited talk at York plasma seminar, York University, UK, April 2016
75. Invited lunch talk at Jodrell Bank observatory, Manchester, UK, April 2016
76. Invited talk at CFSA seminar, Warwick University, UK, April 2016
77. Invited Talk at ITC "Smale-Scale" seminar, Harvard University, MS, October 2015
78. Invited Talk at R. Narayan's group meeting, Harvard University, MS, October 2015
79. Invited Talk at "Cosmic Rays", Princeton University, NJ, April 2015
80. Invited Talk at "Max-Planck Princeton plasma center meeting", Princeton University, NJ, March 2015

Publications

∼2900 citations on Google Scholar, h-index 30, 10 papers with over 100 citations (marked ■, #27, 41, 50, 51, 58, 63, 64, 65, 66). 5 so far most impactful papers are highlighted as bold (#27, 44, 50, 51, 63).

1. Caputo A., Witte S., **Philippov A.**, Jacobson T., Pulsar Nulling and Vacuum Radio Emission from Axion Clouds, arXiv:2311.14795, submitted.

2. Mbarek R., **Philippov A.**, Chernoglazov A., Levinson A., Mushotzky R., The Interplay between accelerated Protons, X-rays and Neutrinos in the Corona of NGC 1068: Constraints from Kinetic Plasma Simulations, arXiv:2310.15222, submitted.

3. Sur A.*, Yuan Y., **Philippov A.**, Radio polarisation of millisecond pulsars with multipolar magnetic fields, arXiv:2402.11474, accepted to ApJ.

4. Bacchini F., **Philippov A.**, Fundamental, Harmonic, and Third-harmonic Plasma Emission from Beam-plasma Instabilities: A First-principles Precursor for Astrophysical Radio Bursts, MNRAS, Volume 529, Issue 1, 169, 2024.

5. Groselj D., Hakobyan H., Beloborodov A., Sironi L., **Philippov A.**, Ab Initio Turbulent Comptonization in Magnetized Coronae of Accreting Black Holes, PRL, 132, 085202, 2024.

6. Davelaar J., Ripperda B., Sironi L., **Philippov A.**, Olivares H., Porth O., van den Berg B., Bronzwaer T., Chatterjee K., Liska M., Synchrotron polarization signatures of surface waves in supermassive black hole jets, ApJL, Volume 959, Issue 1, 2023.

7. Chernoglazov A.*, Hakobyan H., **Philippov A.**, High-Energy Radiation and Ion Acceleration in Three-dimensional Relativistic Magnetic Reconnection with Strong Synchrotron Cooling, ApJ, Volume 959, Issue 2, id.122, 2023.

8. Galishnikova A.*, **Philippov A.**, Quataert E., Polarized anisotropic synchrotron emission and absorption and its application to Black Hole Imaging, ApJ, Volume 957, Issue 2, 103, 2023.

9. Jia H.*, Ripperda B., Quataert E., White C., Chatterjee K., **Philippov A.**, Liska M., Millimeter Observational Signatures of Flares in Magnetically Arrested Black Hole Accretion Models, MNRAS, Volume 526, Issue 2, 2023.

10. Most E., **Philippov A.**, Electromagnetic precursors to black hole - neutron star gravitational wave events: Flares and reconnection-powered fast-radio transients from the late inspiral, ApJL, Volume 956, Issue 2, id.L33, 2023.

11. Zhdankin V., Ripperda B., **Philippov A.**, Particle acceleration by magnetic Rayleigh-Taylor instability: Mechanism for flares in black hole accretion flows, Physical Review Research, Volume 5, Issue 4, article id.043023, 2023. Editors' suggestion.

12. Kempski P., Fielding D., Quataert E., Galishnikova A., Kunz M., **Philippov A.**, Ripperda B., Cosmic ray transport in large-amplitude turbulence with small-scale field reversals, MNRAS, Volume 525, Issue 4, 2023.

13. Mahlmann J., **Philippov A.**, Mewes V., Ripperda B., Most E., Sironi L., Three-dimensional Dynamics of Strongly Twisted Magnetar Magnetospheres: Kinking Flux Tubes and Global Eruptions, ApJL, Volume 947, Issue 2, id.L34, 2023.

14. Fielding D., Ripperda B., **Philippov A.**, Plasmoid Instability in the Multiphase Interstellar Medium, ApJL, Volume 949, Issue 1, id.L5, 2023.

15. Most E., **Philippov A.**, Reconnection-Powered Fast Radio Transients from Coalescing Neutron Star Binaries, PRL, Volume 130, Issue 24, article id.245201, 2023. Editors' suggestion highlited in APS Physics.

16. Galishnikova A.*, **Philippov A.**, Quataert E., Bacchini F., Parfrey K., Ripperda B., Collisionless Accretion onto Black Holes: Dynamics and Flares, PRL, Volume 130, Issue 11, article id.115201, 2023. Journal Cover.

17. Hakobyan H., Ripperda B., **Philippov A.**, Radiative Reconnection-powered TeV Flares from the Black Hole Magnetosphere in M87, ApJL, Volume 943, Issue 2, L29, 2023.

18. Hakobyan H.*, **Philippov A.**, Spitkovsky A., Magnetic Energy Dissipation and γ-Ray Emission in Energetic Pulsars, ApJ, Volume 943, Issue 2, article id. 105, 2023.

19. Mahlmann J. F., Vanthieghem A., **Philippov A.**, Levinson A., Nakar E., Fiuza F., Magnetically driven coupling in relativistic radiation-mediated shocks, MNRAS, Volume 519, Issue 4, 2023.

20. Crinquand B., Cerutti B., Dubus G., Parfrey K., **Philippov A.**, Synthetic Images of magnetospheric reconnection-powered radiation around supermassive black holes, PRL, Volume 129, Issue 20, 205101, 2022. Editors' suggestion featured in APS Physics.

21. **Philippov A.**, Kramer M., Pulsar magnetospheres and their radiation, invited review article in Annual Review of Astronomy and Astrophysics, Vol. 60, pp. 495–558, 2022.

22. Mahlmann J., **Philippov A.**, Levinson A., Spitkovsky A., Hakobyan H., Electromagnetic fireworks: Fast radio bursts from rapid reconnection in the compressed magnetar wind, ApJL, Volume 932, id.L20, 2022. Highlighted by AAS Nova.

23. Most E., **Philippov A.**, Electromagnetic precursor flares from the late inspiral of neutron star binaries, MNRAS, Volume 515, Issue 2, 2022.

24. Yuan Y., Beloborodov A., Chen A., Levin Y., Most E., **Philippov A.**, Magnetar bursts due to Alfvén wave nonlinear breakout, ApJ, Volume 933, Issue 2, 2022.

25. Tolman E., **Philippov A.**, Timokhin A., Electric field screening in pair discharges and generation of pulsar radio emission, ApJL, Volume 933, Issue 2, id.L37, 2022.

26. Most E., Noronha J., **Philippov A.**, Modeling general-relativistic plasmas with collisionless moments and dissipative two-fluid magnetohydrodynamics, MNRAS, Volume 514, Issue 4, 2022.

27 **Ripperda B., Liska M., Chatterjee K., Musoke G., Philippov A., Markoff S., Tchekhovskoy A., Younsi Z., Black Hole Flares: Ejection of Accreted Magnetic Flux through 3D Plasmoid-mediated Reconnection, ApJL, Volume 924, Issue 2, id.L32, 2022.**

28. Vanthieghem A., Mahlmann J., **Philippov A.**, Nakar E., Fiuza F., The role of plasma instabilities in relativistic radiation mediated shocks: stability analysis and particle-in-cell simulations, MNRAS, Volume 511, Issue 2, 2022.

29. Coleman M., Rafikov R., **Philippov A.**, Boundary Layers of Accretion Disks: Discovery of Vortex-Driven Modes and Other Waves, MNRAS, Volume 509, Issue 1, 2022.

30. Coleman M., Rafikov R., **Philippov A.**, Boundary Layers of Accretion Disks: Wave-Driven Transport and Disk Evolution, MNRAS, Volume 512, Issue 2, 2022.

31. Chernoglazov A.*, Ripperda B., **Philippov A.**, Dynamic alignment and plasmoid formation in relativistic magnetohydrodynamic turbulence, ApJL, Volume 923, Issue 1, 2021.

32. Skoutnev, V.*, Most, E., Bhattacharjee, A., **Philippov, A.**, Scaling of Small-Scale Dynamo Properties in the Rayleigh-Taylor Instability, ApJ, Volume 921, Issue 1, id.75, 12 pp., 2021.

33. TenBarge J. M.; Ripperda B.; Chernoglazov A.*; Bhattacharjee A.; Mahlmann J. F.; Most E. R.; Juno J.; Yuan Y.; **Philippov A. A.**, Weak Alfvénic turbulence in relativistic plasmas I: asymptotic solutions, Journal of Plasma Physics, Volume 87, Issue 6, 2021.

34. Ripperda B.; Mahlmann J. F.; Chernoglazov A.*; TenBarge J. M.; Most E. R.; Juno J.; Yuan Y.; **Philippov A.**; Bhattacharjee A., Weak Alfvénic turbulence in relativistic plasmas II: Current sheets and dissipation, Journal of Plasma Physics, Volume 87, Issue 5, 2021.

35. Bransgrove A.*, Ripperda B., **Philippov A.**, Magnetic Hair and Reconnection in Black Hole Magnetospheres, PRL, Volume 127, Issue 5, article id.055101, 2021. Editors' suggestion featured in APS physics, also journal cover.

36. Crinquand B.*, Cerutti B., Dubus G., Parfrey K., **Philippov A.**, Synthetic gamma-ray lightcurves of Kerr black-hole magnetospheric activity from particle-in-cell simulations, A&A, Volume 650, id.A163, pp.11, 2021.

37. Yuan Y., Levin Y., Bransgrove A.*, **Philippov A.**, Alfvén wave mode conversion in pulsar magnetospheres, ApJ, Volume 908, Issue 2, id.176, 12, 2021.

38. Cerutti B., **Philippov A.**, Dubus G., Dissipation of the striped pulsar wind and non-thermal particle acceleration: 3D PIC simulations, A&A, Volume 642, id.A204, pp.11, 2020.

39. Bacchini F., Ripperda B., **Philippov A.**, A GCA-coupled particle pusher for simulations of highly magnetized magnetospheres of compact objects, ApJS, Volume 251, Issue 1, id.10, pp. 16, 2020.

40. Galishnikova A.**, **Philippov A.**, Simulations of the radio polarization of a precessing pulsar PSR J1906+0746, MNRAS, volume 497, Issue 3, pp.2831, 2020.

41 Ripperda B., Bacchini, F., **Philippov A.**, Magnetic reconnection and hot-spot formation in black-hole accretion disks, ApJ, Volume 900, Issue 2, id.100, 14 pp., 2020.

42. Crinquand B.*, Cerutti B., **Philippov A.**, Parfrey K., Dubus G., Multi-dimensional GRPIC simulations of pair discharges around black holes, PRL, volume 124, Issue 14, 145101, 2020.

43. Most E.*, **Philippov A.**, Electromagnetic precursors to gravitational wave events: Numerical simulations of flaring in pre-merger binary neutron star magnetospheres, ApJL, volume 893, Issue 1, id.L6, 2020. Highlighted by AAS Nova.

44 **Philippov A., Timokhin A., Spitkovsky A., On the origin of pulsar radio emission, PRL, volume 124, Issue 24, 245101, 2020. Editors' suggestion featured in APS Physics.**

45. Davelaar J.*, **Philippov A.**, Bromberg O., Singh C., Particle acceleration in Kink-unstable jets, ApJL, volume 896, id.L31, 2020.

46. Bromberg O., Singh C., Davelaar J.*, **Philippov A.**, Kink instability: evolution and energy dissipation in Relativistic Force-Free Non-Rotating Jets, ApJ, volume 884, Issue 1, article id. 39, 2019.

47. **Philippov A.**, Uzdensky D., Spitkovsky A., Cerutti B., Pulsar Radio Emission Mechanism: Radio Nanoshots as a Low Frequency Afterglow of Relativistic Magnetic Reconnection, ApJL, volume 876, Issue 1, article id. L6, 2019.

48. Hakobyan H.*, **Philippov A.**, Spitkovsky A., Effects of synchrotron cooling and pair production on collisionless relativistic reconnection, ApJ, Volume 877, Issue 1, article id. 53, 2019.

49. Werner G., **Philippov A.**, Uzdensky D., Particle acceleration in relativistic magnetic reconnection with strong inverse-Compton cooling in pair plasmas, MNRAS Letters, volume 482, Issue 1, p. L60-L64, 2019.

50 **Parfrey K., Philippov A., Cerutti B., First-Principles Plasma Simulations of Black-Hole Jet Launching, PRL, volume 122, Issue 3, 035101, 2019. Editors' suggestion featured in APS Physics, also journal cover.**

51 **Philippov A., Spitkovsky A., Ab-Initio Pulsar Magnetosphere: Particle acceleration in Oblique Rotators and High-energy Emission Modeling, ApJ, Volume 855, Issue 2, article id. 94, 2018.**

52. Cerutti B., **Philippov A.**, Dissipation of the striped pulsar wind, A&A, Volume 607, id. A134, 2017. Journal Cover.

53. Hakobyan H.**, Beskin V. S., **Philippov A.**, On the mean profiles of radio pulsars II: Reconstruction of complex pulsar light-curves and other new propagation effects, MNRAS, 469, Issue 3, p. 2704-2719, 2017.

54. Gralla S., Lupsasca A., **Philippov A.**, Inclined Pulsar Magnetospheres in General Relativity: Polar Caps for the Dipole, Quadrudipole and Beyond, ApJ, Volume 851, Issue 2, article id. 137, 2017.

55. **Philippov A.**, Rafikov R., Radial Transport and Meridional Circulation in Accretion Disks, ApJ, volume 837, Issue 2, article id. 101, 2017.

56. Cerutti B., Mortier J.*, **Philippov A.**, Polarized synchrotron emission from the wind equatorial current sheet in gamma-ray pulsars, MNRAS Letters, vol. 463, issue 1, p. L89-L93, 2016.

57. Gralla S., Lupsasca A., **Philippov A.**, Pulsar Magnetospheres: Beyond the Flat Spacetime Dipole, ApJ, volume 833, Issue 2, article id. 258, 2016 (alphabetic author order).

58 Cerutti B., **Philippov A.**, Spitkovsky A., Modeling high-energy pulsar lightcurves from first principles, MNRAS, volume 457, issue 3, p. 2401-2414, 2016.

59. Tchekhovskoy A., **Philippov A.**, Spitkovsky A., Three-dimensional analytical description of magnetized winds from oblique pulsars, MNRAS, volume 457, issue 3, 2016.

60. **Philippov A.**, Rafikov R., Stone J.M., Spreading Layers in Accreting Objects: Role of Acoustic Waves For Angular Momentum Transport, Mixing and Thermodynamics, ApJ, volume 817, issue 1, article id. 62, 2016.

61. **Philippov A.**, Cerutti B., Spitkovsky A., Tchekhovskoy A., Ab-Initio Pulsar Magnetosphere: The Role of General Relativity, ApJ Letters, volume 815, issue 2, L19, 2015.

62. Arzamasskiy L.**, **Philippov A.**, Tchekhovskoy A., Time evolution of the non-spherical pulsar, MNRAS, volume 453, issue 4, p. 3540-3553, 2015.

63 **Philippov A., Spitkovsky A., Cerutti B., Ab-Initio Pulsar Magnetosphere: Three-dimensional Particle-in-cell Simulations of Oblique Pulsars, ApJ Letters, volume 801, issue 1, L19, 2015.**

64 Cerutti B., **Philippov A.**, Parfrey K., Spitkovsky A., Particle acceleration in axisymmetric pulsar current sheets, MNRAS, volume 448, issue 1, p. 606-619, 2015.

65 **Philippov A.**, Spitkovsky A., Ab-Initio Pulsar Magnetosphere: Three-dimensional Particle-in-cell Simulations of Axisymmetric Pulsars, ApJ Letters, volume 785, issue 2, L33, 2014.

66 **Philippov A.**, Tchekhovskoy A., Li J. G., Time evolution of pulsar obliquity angle from 3D simulations of magnetospheres, MNRAS, volume 441, issue 3, 2014.

67. **Philippov A.A.**, Rafikov R.R., Analysis of Spin-Orbit Misalignment in Eclipsing Binary DI Herculis, ApJ, vol. 768, issue 2, article id. 112, 2013

68. Beskin V.S., Istomin Ya.N., **Philippov A.A.**, Radiopulsars – search for the truth, review paper, Physics Uspekhi, 56, 2, 2013.

69. Istomin Ya.N., **Philippov A.A.**, Beskin V.S., On the collective curvature radiation, MNRAS, vol. 422, issue 1, p. 232-240, 2012.

70. Beskin V.S., **Philippov A.A.**, On the mean profiles of radio pulsars – I. Theory of propagation effects, MNRAS, vol. 425, issue 2, pp. 814-840, 2012.

71. Krylenko Yu. V., Mikhailov Yu. A., Orekhov A. S., Sklizkov G. V., **Philippov A. A.**, Dependence of the temperature of stochastically heated electrons on the flux density of pulsed laser radiation on a target, in russian, Bulletin of the Lebedev Physics Institute, vol. 37, issue 10, p. 324-329, 2010.

* marks PhD students I advised, ** marks undergraduate students I advised.