

Bart Ripperda

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Professional Experience

2022 to present	Assistant Professor Canadian Institute for Theoretical Astrophysics, Department of Physics, Department of Astronomy and Astrophysics University of Toronto, Toronto, Canada
2023 to present	Affiliate Perimeter Institute for Theoretical Physics, Waterloo, Canada
2018 to present	Member of the Event Horizon Telescope Collaboration
2022 to 2023	Member School of Natural Sciences, Institute for Advanced Study, Princeton, US
2022 to 2023	NASA Hubble Fellowship Program Einstein Fellow School of Natural Sciences, Institute for Advanced Study, Princeton, US
2019 to 2022	Princeton Computational Astrophysics Fellow Department of Astrophysical Sciences, Princeton University, Princeton, US
2019 to 2022	Flatiron Research Fellow Center for Computational Astrophysics, Flatiron Institute, New York, US
2018 to 2019	Humboldt Postdoctoral Prize Fellow Institute for Theoretical Physics, Goethe University, Frankfurt am Main, Germany
2017 to 2018	Visiting Research Scholar Department of Astronomy, Columbia University, New York, US, Advisor: Prof. Lorenzo Sironi
2011	Visiting Research Scholar Culham Centre for Fusion Energy, Oxford, UK, Advisor: Dr. Rory Scannell

Education

2014 to 2018	Ph.D. in Mathematics KU Leuven University, Leuven, Belgium, Thesis advised by Prof. Rony Keppens: “ <i>on magnetic reconnection and particle acceleration in relativistic plasmas</i> ”
2013 to 2014	Part III of the Mathematical Tripos University of Cambridge, Cambridge, UK
2009 to 2013	M.Sc. in Physics Eindhoven University of Technology, Eindhoven,

	Netherlands, <i>average of 8.5/10 (top 3% of the class)</i> , Thesis advised by Prof. GertJan van Heijst: <i>Stability of two-dimensional zonal flows</i>
2009 to 2013	M.Sc. in Engineering Eindhoven University of Technology, Eindhoven, Netherlands, <i>average of 8.3/10 (with distinction)</i> , Thesis advised by Prof. Henk Nijmeijer: <i>Stability of two-dimensional zonal flows</i>
2006 to 2009	B.Sc. in Engineering Eindhoven University of Technology, Eindhoven, Netherlands, <i>with a minor and pre-master in physics</i>
2000 to 2006	Gymnasium (preparation for scientific education) College Rolduc high school, Kerkrade, Netherlands, <i>cum laude, first of class</i>

Grants and Awards

<i>Research Grants & Fellowships</i>	Co-PI on Canadian Space Agency grant, <i>A Joint Mid-IR and X-ray Investigation of the Physics Driving Sgr A*'s Flares</i> , \$85.000, 25JWGO4A01, 2026-2028
	PI on Simons Collaborations in Mathematics and the Physical Sciences program, Simons Collaboration on Extreme Electrodynamics of Compact Sources, total \$14.000.000, 2023 to 2030 (renewed in 2027)
	Co-PI on KU Leuven global seed fund, <i>Outflows from the Sun and from black holes: Similarities and extreme plasma physics</i> , \$96.000, 2026
	Co-I on Data Sciences Institute Emergent Data Sciences grant, Bridging the Gap: From Computational Physics, to Physics-informed Machine Learning, to Data-driven Scientific Discovery, \$100.000, 2025
	PI on NSERC Research Tools and Instruments grant, <i>Developing accurate radiative transport methods with GPU-accelerated computing</i> , \$150.000, RTI-2024-00306, 2024
	Co-PI on Ontario Research Fund - Research Excellence Stream 1: Basic and Applied Research Round 12, <i>AI and Quantum Enhanced Astronomy</i> , \$2.000.000, 2024-2029
	PI on NSERC Alliance grant, <i>Radiative magnetohydrodynamics of bright transients from neutron stars</i> , \$300.000, ALLRP 592744 - 24, 2024-2027
	PI on Connaught New Researcher Award, \$25.000, 2024-2025
	PI on NSERC Undergraduate Student Research Award (USRA), <i>Fast magnetic field growth in a turbulent plasma</i> , Shashvat Varma, 2024
	Grant for Scientific Stay in Belgium, Research Foundation Flanders (FWO), \$5000, V506024N, 2024

PI on XSeed grant, *GPU-Accelerated Radiative General Relativistic Magnetohydrodynamics Toolkit on Cubed-Sphere Meshes for Plasma-Astrophysics*, \$60.000, 2024-2026

PI on Arthur B. McDonald Canadian Astroparticle Physics Research Institute Advancing EDII Fund, \$1000, 2024

Co-PI on Canadian Space Agency grant, *Sgr A* as Particle Accelerator: What Drives the Black Hole's Variable IR*, \$100.000, 23JWGO2A01, 2024-2025

Co-PI on NASA ATP, *Radiative magnetohydrodynamics of bright transients from neutron stars*, \$875.064, 23-ATP23-0128, 2024-2027

Co-PI on NASA ATP, *Mass loading and hadronic acceleration in AGN jets*, \$706.839, 23-ATP23-0076, 2024-2027

Co-PI on Advanced Micro Devices, Inc. gift to support research in AI and quantum astronomy at the University of Toronto, \$200.000, 2023-2025

PI on NSERC Discovery grant and Launch Supplement, *Multiwavelength emission in the high-energy universe*, Grant number RGPIN-2023-04844, \$177.500, 2023 to 2028

NASA Hubble Fellowship Program Einstein fellowship, 2023 to 2026
Princeton University/Flatiron Institute Joint Postdoctoral Prize Fellowship, 2019 to 2023

Collaborator on NSF WoU-MMA, *Role of the dynamo effect in neutron star mergers*, 2022-2025

Collaborator on NASA ATP, *First-Principles Simulations of Black-Hole Magnetospheres*, 21-ATP21-0057, 2022-2025

Collaborator on NASA ATP, *Simulating Luminous Black Hole Accretion Disks and Coronae*, 21-ATP21-0077, 2022-2025

Humboldt Postdoctoral Prize Fellowship, 2018 to 2020

Research Foundation Flanders (FWO) travel grant (€ 800), 2018

YouReCa Junior Mobility Program travel grant (€ 4000), 2018

Research Foundation Flanders (FWO) grant for long term stay abroad (€ 5500), 2017

Nordita travel grant (2500 SEK), 2015

FLOF Ph.D. scholarship, KU Leuven University, 2014 to 2018

Hughes Hall Bursary, University of Cambridge (£ 2500), 2014 (declined)

DAMTP Ph.D. scholarship, University of Cambridge, 2013 (declined)

Vreedefonds study grant (€ 6000), 2013

FuseNet travel grant (€ 2500), 2012

Observing Time as PI or Co-I

Joint Chandra/JWST cycle 28, 28700250, *Probing Particle Injection in Sgr A*'s Flares with Joint Chandra X-ray and JWST MIR Observations*, 100ks, 2026

Chandra cycle 28, 28700297, *Spacetime and Spectra: Joint Chandra/EHT/NuSTAR Observations of M87*, 5ks, 2026

James Webb Space Telescope Cycle 4, ID: 7532, *A Joint Mid-IR and X-ray Investigation of the Physics Driving Sgr A*'s Flares*, 34.4 primary spacecraft hours, 2025

Chandra Cycle 27, *A Movie Campaign on M87: Chandra, NuSTAR, Hubble, and the EHT*, 20 kseconds

VLBA/25A-480, *Localizing and Classifying the Structure of MAXI J1744-292 with the VLBA*, 8.0 hours, 2025

VLA/25A-476, *Monitoring the Radio SED of a New Transient within 20" of Sgr A**, 6.72 hours, 2025

VLA/25B-221, *VLA Observations of Sgr A* in Support of Possible SMA/MIRI/Chandra Monitoring*, 28 hour, 2025

ALMA, 2024.A.00036.S, *Full-Stokes Submillimeter Coverage during a JWST+Chandra-led Multiwavelength Campaign of Sgr A**, 2025

XMM-Newton, 096236, *The XMM-Newton/Event Horizon Telescope View of Sgr A**, 54000 sec, 2025

SMA telescope, ID: 2025A-S037, 4 A tracks and 5 B tracks, 2025

VLBA and VLA, 25A-312/314, *Continued Radio Monitoring of Sgr A* with the 2025 EHT Multiwavelength Campaign*, 14 hours, 2025

ALMA, 2023.A.00036.S, *Coordinated ALMA-JWST observations of Sgr A**

Chandra Cycle 26, *Spacetime and Spectra: Joint Chandra/EHT/NuSTAR Observations of M87*, 5 kseconds

GMVA, GMVA/24B-138, *In light of the shadow: mm-VLBI study of M81* in the context of Sgr A* and M87**, 12 hours, 2024

James Webb Space Telescope Cycle 2, ID: 3324, *Sgr A* as Particle Accelerator: What Drives the Black Hole's Variable IR and X-ray Emission?*, 29.88 primary spacecraft hours, 2024

*Computing Time
as PI or Co-PI*

Chandra cycle 25, *Spacetime & Spectra: Joint Chandra/JWST/EHT Observations of Sgr A**, 75 kseconds, 2024

Effelsberg 100-m telescope, *Monitoring for radio flares of M81*, # 98-23

EuroHPC Extreme Scale, 2026 to 2027, *Numerical Modeling of Coherent Radio Emission from Pulsars* (EHPC-EXT-2026E01-131), 8 million GPU hours

Digital Research Alliance of Canada, Resources for Research Groups, 2024 to 2026, *Subgrid kinetic models for magnetohydrodynamics transform our understanding of black holes and neutron stars* (ID 5791), 52 million CPU hours and 3 million GPU hours

TACC Frontera/Vista Leadership Resource Allocation, 2025, *Simulations of reconnection-powered flares in magnetospheres of magnetars, binary neutron stars and black holes*, 52 million CPU hours, 59,712.0 GPU Node Hours

Flemish Supercomputing Center tier 1 grant, 2025 to 2026, *Explaining submillimeter counterparts to infrared and X-ray flares observed with ALMA and the James Webb Space Telescope from the supermassive black hole in the center of the Milky Way II: long-term statistics*, 24 million CPU hours

Nvidia Academic Grant program, 2025, GPU Framework for Real-Time Calculation of 3D Interstellar Radiation Fields, 32000 GPU hours

Digital Research Alliance of Canada, Resources for Research Groups, 2024 to 2026, *Radiative MHD of bright transients from neutron stars* (ID 5016), 14 million CPU hours and 500.000 GPU hours

LUMI grant 2024.049, 2024 to 2025, *Investigating Black Hole Spin Dependence in Magnetically Arrested Disks Using High-Resolution General Relativistic MHD Simulations*, 100.000 CPU hours, 70.000 GPU hours

Flemish Supercomputing Center tier 1 grant, 2024 to 2025, *More realistic accretion models for the supermassive black hole in the Galactic Center*, 48 million CPU hours, 80.000 GPU core hours

SuperMUC-NG Allocation, 2024 to 2025, *The Small-and-Large-Scale Kelvin Helmholtz Dynamo at Extreme Resolutions to Unravel the Nature of Magnetic Field Growth in Binary Neutron Star Mergers*, 20 million CPU hours

TACC Frontera/Longhorn Leadership Resource Allocation, 2024, *Simulations of reconnection-powered flares in magnetospheres of*

magnetars, binary neutron stars and black holes, 110 million CPU hours

Flemish Supercomputing Center tier 1 grant, 2023 to 2024,
Dynamo's in accretion disks: how did the magnetic field get there?, 36 million CPU hours

SummitPlus award, Oak Ridge National Laboratory, 2024, *Radiative MHD of bright transients from neutron stars*, 250000 GPU node hours

Flemish Supercomputing Center tier 1 grant, 2023 to 2024, *Radiation General Relativistic magnetohydrodynamics simulations of formation of black hole accretion disk coronae in active galactic nuclei*, 57600 GPU node hours

INCITE award, Oak Ridge National Laboratory, 2024, *Radiation General Relativistic MHD Simulations of Accretion Disk Outbursts*, 750000 GPU node hours

TACC Frontera/Longhorn Leadership Resource Allocation, 2023,
Simulations of reconnection-powered flares in magnetospheres of magnetars, binary neutron stars and black holes, 55 million CPU hours

TACC Xsede ACCESS allocation, 2022, *Nonthermal particle acceleration in astrophysical plasma turbulence*, 3 million CPU hours

INCITE award, Oak Ridge National Laboratory, 2023, *Radiation transport general relativistic MHD simulations of transitional accretion disks*, 750000 GPU node hours

Flemish Supercomputing Center tier 1 grant, 2022 to 2023,
The first general relativistic kinetic simulations of black hole jet formation in the center of the Milky Way, 52 million CPU hours

TACC Frontera/Longhorn Leadership Resource Allocation, 2022,
Simulations of reconnection-powered flares in magnetospheres of magnetars, binary neutron stars and black holes, 44 million CPU hours

NWO Cartesius tier 1 grant, 2021, *Magnetic reconnection in relativistic outflows*, 5 million CPU hours

TACC Frontera/Longhorn Leadership Resource Allocation, 2021,
Simulations of reconnection-powered flares in magnetospheres of magnetars, binary neutron stars and black holes, 44 million CPU hours

Flemish Supercomputing Center tier 1 grant, 2021 to 2022,
Probing the structure of spacetime with photon rings, 44 million CPU hours

Flemish Supercomputing Center tier 1 grant, 2020 to 2021, *Resolving*

turbulence in black hole magnetospheres, 11 million CPU hours

PRACE Distributed European Computing Initiative Supercomputing Allocation, 2020, *High resolution simulations of black hole accretion*, 5 million CPU hours

TACC Frontera/Longhorn Leadership Resource Allocation, 2020, *Investigating electromagnetic precursors to neutron star merger gravitational wave events*, 17 million CPU hours, 2 million GPU hours

Flemish Supercomputing Center tier 1 grant, 2019 to 2020, *Localising and resolving current sheets in black hole magnetospheres*, 18 million CPU hours

TACC Stampede Xsede startup grant, 2019, *Kink instabilities in astrophysical jets*, 100,000 CPU hours

Flemish Supercomputing Center tier 1 grant, 2019, *Detection of current sheets in kinking relativistic jets*, 7 million CPU hours

Flemish Supercomputing Center tier 1 grant, 2019, *Effects of dark matter charge on plasma accretion flows at the Galactic Centre*, 3 million CPU hours

Flemish Supercomputing Center tier 1 grant, 2018, *String theory signatures in black hole shadows*, 3 million CPU hours

NWO Cartesius tier 1 grant, 2018, *High resolution simulations of accreting black holes*, 6 million CPU hours

Flemish Supercomputing Center tier 1 grant, 2015 to 2017, *Outflows and Particle Evolution in Relativistic Astrophysics*, 11 million CPU hours

*Personal awards
and mentions*

[AAS NOVA research highlight 2025](#), Black Hole vs. Magnetized Neutron Star: Matchup Predictions, Y. Kim, E.R. Most, A. Beloborodov, B. Ripperda

[AAS NOVA monthly roundup 2025](#), Monthly Roundup: The Supermassive Black Hole of Messier 87, S. Solanki, J. Davelaar, B. Ripperda, A.A. Philippov

[AAS NOVA research highlight 2024](#), *Monster Shocks from Collapsing Magnetars*, E.R. Most, A. Beloborodov, B. Ripperda

SummitPlus Scientific achievement 2024,
<https://www.ornl.gov/news/summit-supercomputers-bonus-year-scientific-achievement>,
<https://www.olcf.ornl.gov/2024/12/03/summits-bonus-year-of-scientific-achievement/>

Top Cited Paper Award 2023 in Astronomy and Astrophysics, IOP

publishing (top 1% most-cited papers), *Magnetic reconnection and hot spot formation in black hole accretion disks*

PRL Cover image for *Collisionless accretion onto black holes: dynamics and flares*, A. Galishnikova, A.A. Philippov, E. Quataert, F. Bacchini, K. Parfrey, B. Ripperda

PRL editors' suggestion, Cover image & APS Physics synopsis for *Magnetic hair and reconnection in black hole magnetospheres*, A. Bransgrove, B. Ripperda, A.A. Philippov

2020 European Physical Society Plasma Physics Division PhD Research Award (€ 1000) | In recognition of truly outstanding research achievements associated with their PhD study in the broad field of plasma physics

Best poster Prize (€ 100), WE-Heraeus Seminar on Accretion in Strong Gravity, 2019

Honorary scholar of Hughes Hall, University of Cambridge, 2014

Collaborative awards **2021 Royal Astronomical Society Group Achievement Award** | As part of the Event Horizon Telescope Collaboration

2020 Einstein Medal | As part of the Event Horizon Telescope Collaboration | For the first image of the candidate supermassive black hole at the centre of the giant elliptical galaxy M87

2020 Breakthrough Prize in Fundamental Physics (\$ 3,000,000) | As part of the Event Horizon Telescope Collaboration | For the first image of a supermassive black hole, taken by means of an Earth-sized alliance of telescopes.

2020 Bruno Rossi Prize | As part of the Event Horizon Telescope Collaboration | For their landmark image and analysis of the first shadow of a black hole

2019 NSF Diamond Achievement Award | As part of the Event Horizon Telescope Collaboration |

Leadership Experience

Large Collaborations **Event Horizon Telescope Collaboration** | Coordinator of the Electron Distribution Function Working Group

Mentorship **National Society of Black Physicists** | Simons-NSBP mentor for undergraduate scholars fellowship program, 2020-2021

Technical Experience

Computing skills

Programming languages: Fortran, Python
Codes: BHAC; H-AMR, Athena++; Tristan-MP, GR-Zeltron
Analysis: Paraview, Visit, Matlab, Maple, IDL, Mathematica
Presentation: Latex, Overleaf, Wordpress, Office, GitLab, GitHub
Operating systems: Linux, MacOS, Windows
HPC: Canada (Trillium), Belgium (BrENIAC, Hortense), the US (Summit, Frontera, Stampede, CORI NERSC), Germany (JUDGE cluster Jülich, SuperMUC Leibniz), Netherlands (Tier-1 cluster Cartesius), Poland (Eagle PSNC)

Communication skills **Spoken languages:** Dutch (native), English (full working proficiency, TOEFL score 112), German (working proficiency)

Teaching and Mentorship

Ph.D. committees

Sarah Han, University of Toronto, 2030
Leanne Davis, University of Toronto, 2029
Michael Power, University of Toronto, 2028
Siddharth Yajaman, University of Toronto, 2028
Diego Montalvo, University of Toronto, 2027
Matus Labaj, Masaryk University, 2026
Vasilii Pustovoit, University of Toronto, 2026

Ph.D. defenses

Anthony Chow, Columbia University, New York, 2026
Dominic Bernardi, University of Washington, St Louis, 2026
Geetam Mall, University of Toronto, 2026
Shivan Khullar, University of Toronto, 2025
Thierry Serafin Nadeau, University of Toronto, 2025
Ayush Pandhi, University of Toronto, 2025
Fatemeh Kayanikhoo, Nicolaus Copernicus Astronomical Center of the Polish Academy of Sciences, 2024
Pushpita Das, University of Amsterdam, 2024

High school students mentored

Minghao Zou (now undergrad at MIT),
Cambridge Center for International Research, 2023,
project: Hadronic interactions from accelerated protons around black holes

Gabe Benning (now undergrad at Princeton), Cambridge Center for
International Research, 2023,
project: Relativistic particles around neutron stars

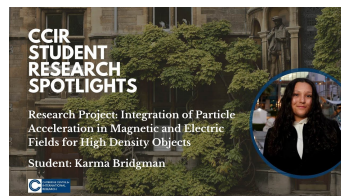
Adrien Cristian, Cambridge Center for International Research, 2023,
project: Simulating charged particles in electromagnetic fields

Neer Mehta (now undergrad at Cornell), Cambridge Center for
International Research, 2023,

project: Raytracing the shadow image of a wormhole
(<https://doi.org/10.59720/24-074>), see:



Karma Bridgman, Cambridge Center for International Research, 2023,
project: Charged particle dynamics around black holes, see:



Undergrad students mentored

Brian Huang, B.Sc student at University of Toronto, 2026-2027, co mentored with Dr. Koushik Chatterjee, project: Misaligned accretion flows

Shubham Sharma, B.Sc student at University of Toronto, 2026-2027, co mentored with Dr. Koushik Chatterjee, project: Bondi accretion

Hanish Kanda, B.Sc student at University of Toronto, 2026-2027, co mentored with Dr. Koushik Chatterjee, project: Super-magnetized accretion flows

Johnny Chen, B.Sc student at University of Toronto, 2026-2027, co mentored with Dr. Koushik Chatterjee, project: Magnetic pulses from magnetars

Matin Shams, B.Sc student at Delft University of Technology (now M.Sc student in Oxford), 2023-2025, project: Rayleigh Taylor instabilities in black hole accretion disks

Khush Negandhi, B.Sc student at University of Toronto, 2025-2026, co mentored with Dr. James Beattie, project: Solving the Cole-Hopf transformed Magnetohydrodynamics equations on a quantum computer

Maëlle Magnan, B.Sc student at University of Toronto, 2025-2026 (now PhD student at NYU), project: synchrotron radiation in relativistic magnetohydrodynamics

Jaden Cabral Cordeiro, B.Sc student at University of Toronto, 2025-2026

(now PhD student at University of Toronto), co-mentored with Dr. James Beattie, project: transport of helicity in turbulence

Zachary Ireland, B.Sc student at University of Toronto, 2025-2026, co-mentored with Dr. Sebastiano von Felleberg, project: How does gas accrete onto Sgr A*, fuel the black hole, and produce flares

Daniel Hagyard, B.Sc student at University of Toronto, 2025-2026, co-mentored with Dr. James Beattie, project: Modeling plasma turbulence experiments

Max Sokolova, B.Sc student at University of Toronto (now M.Sc student in Toronto), 2024-2025, co-mentored with Dr. James Beattie, project: A Cole-Hopf transform for the Magnetohydrodynamics equations

Juan Miguel Padilla, B.Sc student at University of Toronto, 2024-2025, co-mentored with Dr. James Beattie, project: Supersonic vortices - understanding the building blocks of supersonic, sub-Alfvénic magnetohydrodynamic turbulence

Mayank Shenoy, B.Sc student at University of Toronto (now MSc at Imperial College London), 2023-2025, co-mentored with Dr. Sean Ressler, project: Magnetic reconnection in wind-fed accretion

Shashvat Varma, B.Sc student at University of Toronto (now PhD student in Toronto), 2023-2024, co-mentored with Dr. James Beattie, project: fast-in-time dynamics of the small-scale dynamo

Sam Lakerdas-Gayle, B.Sc student at University of Toronto, 2023-2024, co-mentored with Dr. James Beattie, project: Over-dense regions in interstellar turbulence

Emmanuel Aneke, Simons Observatory, Simons-National Society of Black Physicists Scholars Program, 2020-2021, co-mentored with Prof. Sasha Philippov, project: Magnetic reconnection in the Crab and Vela pulsars

*M.Sc students
mentored*

Maya Cadieux, M.Sc student at University of Toronto, 2025 to 2026, project: Waves in neutron star and black hole magnetospheres

Louis Burnaz, M.Sc student at Ecole Normale Supérieure de Lyon (now Ph.D student at CEA in France), 2024
project: Fast radio bursts from pulse-reconnection interaction

Tanisha Ghosal, M.Sc student at University of Toronto, 2023 to 2024
project: Particle acceleration in relativistic reconnection

Seppe Staelens, M.Sc student at KU Leuven (now PhD student at DAMTP, Cambridge University, 2022, co-mentored with Prof. Fabio Bacchini and Dr. Daniel Mayerson, project: photon rings

beyond general relativity

Sebastiaan Selvi, M.Sc student at Eindhoven University of Technology and KU Leuven, 2018, co-mentored with Prof. Rony

Keppens, project: resistive magnetohydrodynamics simulations of relativistic reconnection

Doctorate students mentored

Ben Scully, Ph.D student at University of Toronto, 2026 *to* present, project: Pulsar winds and coherent emission

Joost de Kleuver, Ph.D student at Radboud University Nijmegen, 2025 *to* present, project: dynamics of magnetically arrested disks and jets

Maya Cadieux, Ph.D student at University of Toronto, 2025 *to* present, project: Waves in neutron star and black hole magnetospheres

Matus Labaj, PhD student at Masaryk University, Czech Republic, and visiting student at University of Toronto, 2023 *to* present, project: wind-fed accretion in Sagittarius A*, co-advised with Michal Zajacek

Braden Seefeldt-Gail, Ph.D. student at University of Toronto, 2023 *to* present, project: The evolution of flux tubes in magnetically arrested accretion disks

Alicia Savelli, Ph.D. student at University of Toronto, 2023 *to* present, project: Turbulence and reconnection in black hole accretion disk coronae

Michael Grehan, Ph.D. student at University of Toronto, 2023 *to* present, project: Three-dimensional turbulent reconnection in neutron star magnetospheres

Sophia Sanchez-Maes, Ph.D. Pre-doc fellow at Flatiron Institute and Ph.D student at Harvard University, 2021 *to* 2022, co-mentored with Prof. Sasha Philippov, project: turbulent reconnection in magnetically arrested accretion disks

Sebastiaan Selvi, Ph.D. student at University of Amsterdam, 2019 *to* present, co-mentored with Prof. Oliver Porth, project: Relativistic magnetic reconnection in kinetic and fluid descriptions

Alexander Chernoglazov, Pre-doc fellow at Flatiron Institute and Ph.D. student at University of Maryland, 2020 *to* 2021, co-mentored with Prof. Sasha Philippov, project: 3D resistive magnetohydrodynamics simulations of relativistic turbulence

Ashley Bransgrove, Ph.D. student at Columbia University, 2019 *to* 2021, co-mentored with Prof. Sasha Philippov, project: Balding black holes through magnetic reconnection

	Egor Novoselov, Ph.D. student at Columbia University, 2019 <i>to</i> 2020, co-mentored with Prof. Lorenzo Sironi, project: Magnetar flares in 3D force-free-magnetohydrodynamics simulations
<i>Postdoc fellows mentored</i>	James Beattie, CITA/Princeton Fellow, 2023 <i>to</i> 2026 (now Hubble fellow at IAS) Luciano Combi, CITA National Fellow, 2023 <i>to</i> 2026 (now KIPAC fellow at Stanford) Sebastiano von Fellenberg, Feodor-Lynen fellow, 2025 <i>to</i> 2026 (now Nobel laureate fellow at Max Planck Institute Garching) Sean Ressler, CITA Fellow, 2023 <i>to</i> 2026 (now faculty at University of Tennessee Knoxville) Gibwa Musoke, CITA Fellow, 2023 <i>to</i> present Aretaios Lalakos, CITA/Caltech Fellow, 2024 <i>to</i> present Vera DelFavero, CITA fellow, 2025 <i>to</i> present Koushik Chatterjee, CITA fellow, 2025 <i>to</i> present Vittoria Berta, CITA/Columbia University fellow, 2025 <i>to</i> present Bindesh Tripathi, CITA/Columbia University fellow, 2025 <i>to</i> present Camille Granier, CITA/Stanford Fellow, 2025 <i>to</i> present Rohan Dahale, Schmidt AI Fellow, 2025 <i>to</i> present Pavan Vynatheya, CITA fellow, 2025 <i>to</i> present Hannah Collier, Schmidt AI Fellow, 2026 <i>to</i> present Andrew Sullivan, CITA/Columbia University fellow, 2026 <i>to</i> present Hyerin Cho, CITA/Caltech Fellow, 2026 <i>to</i> present
<i>Undergrad teaching</i>	Undergraduate course on numerical methods and data analysis, Canadian Institute for Theoretical Astrophysics, 2025 - 2026
<i>Graduate teaching</i>	Graduate course on radiation and gas dynamics, University of Toronto Astronomy Department, 2024 - 2026 Graduate course on plasma physics University of Toronto Astronomy Department, 2023 - 2026
<i>Lecturing</i>	Lecturer at Caltech Relativistic Astrophysics Summer School, June 2025 Lecturer on basics of astro-plasma physics for high school students at KU Leuven Summer of Science, 2023-2026 Lecture series on special and general relativity for high school students at the Cambridge Center for International Research lecture series, 2023-2026 Lecturer on relativistic astrophysics for the summer enrichment program for Michigan Math and Science Scholars, University of Michigan, 2020 Lecturer on relativistic magnetohydrodynamics, force-free electrodynamics, numerical methods in astrophysics, for a graduate course in Astrophysical Fluid Dynamics, Columbia University Astronomy Department, 2019 <i>to</i> 2020

CSAM-15 Workshop given on Computational Solar and Astrophysical Modeling, Jülich, Germany, September 2015

Teaching Assistant Undergraduate level mathematics & physics courses at KU Leuven, 2014 to 2018 (8 hours per week): Calculus I, Calculus II, Analysis, Differential Equations, Linear Algebra
Graduate level mathematics & physics courses at KU Leuven, 2016 to 2017: Computational Methods for Astrophysical Applications
Undergraduate level engineering course at Eindhoven University of Technology, 2011 to 2013: Technology Assessment

Service and Organization

Committees Chair of Digital Research Alliance of Canada, Astronomy, Astrophysics, and Cosmology committee, 2026 - present
Advisory board member CCIR and the Princeton STEM Initiative, August 2026 - present
CITA mentorship program (3 mentees per year), 2024 - present
Graduate Admissions Committee, Physics Department, University of Toronto, 2026 - present
Astronomy mentoring program (1 mentee per year), 2026 - present
Computing Committee CITA, University of Toronto, 2023 - present
Colloquium Committee, Physics Department, University of Toronto, 2023 - 2025
CITA National Mentoring program, 2023 - present
Postdoc Hiring Committee, CITA, University of Toronto, 2022 - present
First aid committee and training, 2025 - present
Director Hiring Committee CITA, University of Toronto, 2026
Visitors Committee, CITA, University of Toronto, 2023 - 2025
Associate Professor Hiring Committee CITA, University of Toronto, 2024
Full Professor Hiring Committee CITA, University of Toronto, 2024
Director Hiring Committee CITA, University of Toronto, 2024
Graduate Program and hiring Committee, Astronomy and Astrophysics Department, University of Toronto, 2024 - present
Review panels The National Killam Program, 2026

Deutsche Forschungsgemeinschaft (German Research Foundation), 2024 - present

Digital Research Alliance of Canada's Resource Allocation Competition, 2025-2027

NASA's FINESST (Future Investigators in NASA Earth and Space Science and Technology) Program, September 2026

Humboldt Feodor Lynen fellowship program, 2026

NWO Talent Programme, VENI, 2026

ERC advanced grant review panel, 2026

NOVA Program of FRQ and NSERC, 2026

Chilean Study Group of Astronomy and Astrophysics, Sub-Directorate for Research Projects (SPI-FONDECYT), 2026

NSERC Canada graduate scholarships - Masters level committee, 2025

United States-Israel Binational Science Foundation grant competition, 2025

NSF Astronomy and Astrophysics Research Grants (AAG), 2024-2026

Hubble Space Telescope Cycle 32, December 2024

Flemish Science Organization (FWO) Review College, 2023-2026

Hubble Space Telescope Cycle 31, July 2023

NASA ROSES-22, ULTRASAT, May 2023

Belgian Physical Society Master Prize, April 2023

NASA's FINESST (Future Investigators in NASA Earth and Space Science and Technology) Program, March 2022

NASA Swift Mission Cycle 18, December 2021

Peer Review

Science, Nature, Physical Review Letters, Nature Astronomy, Nature Communications, Physical Review D, Journal of Plasma Physics, Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society, Astrophysical Journal, Physics of Plasmas, Journal of Computational Physics, Mathematical Methods in the Applied Sciences, Earth, Planets and Space, European Physical Journal C, Open Astronomy, Internal review Event Horizon Telescope Collaboration

Colloquia & Conferences

SOC of the IAU symposium on Traversing the Galactic Center in Space and Time, Brno, Czech Republic, 2026

Organization of International Space Science Institute workshop, A First Peek at the Galactic Center with JWST, Switzerland, 2024-2025

Organization of Magnetic Fields Around Compact Objects conference, Perimeter Institute, Canada, March 2025

Organization of bimonthly black hole seminars for Simons Collaboration on extreme electrodynamics of compact stars, 2024-2025

LOC and SOC for CASCA-TO 2024, Canada, April 2024

Organization of an Equity, Diversity and Inclusion workshop at University of Toronto, May 2024

Organization of Princeton Center for Theoretical Sciences Workshop on Improving Black Hole Accretion Models with Plasma Theory, US, February 2023

Organization of Princeton Center for Theoretical Sciences Workshop on Weather and Climate on Neutron Stars: Flow and Observation Connections, Princeton, US, April 2022

Organization of Flatiron - CCA workshop on Weather and Climate on Neutron Stars: Flow and Observation Connections, New York, US, June 2021

Moderator at Polarized Radiation near Supermassive Black Holes, PCTS workshop, Princeton, US, May 2021

Organization of weekly Astrophysical Fluid Dynamics and Methods meeting, Center for Computational Astrophysics, New York, US, 2020 *to present*

Organization of monthly Plasma Physics Meeting, Center for Computational Astrophysics and Princeton Plasma Physics Laboratory, Princeton/New York, US, 2019 *to present*

Organization of the Athena++ developers workshop, New York, US, October 2020

Chair at ASTRONUM, 13th International Conference on Numerical Modeling of Space Plasma Flows, Panama City Beach, US, June 2018

Organizing Committee member, European Physical Society 43rd Conference on Plasma Physics, Leuven, Belgium, July 2016

Local Organizing Committee member, Workshop CSAM-15 on Computational Solar and Astrophysical Modeling, Jülich, Germany, September 2015

Diversity and Outreach

Lecture for STEM Talent Search program CCIR and the Princeton STEM Initiative, September 2026

Advisory board member CCIR and the Princeton STEM Initiative, August 2026 - present

Laugh & Learn Toronto, June 2026

Talk at tech event for Brain Box Labs and Creative Currency, June 2026

Brains & Barstools, March 2026

Sip and Scholar, Toronto's New Thought Series, March 2026

Panel member for faculty and postdoc applications at CITA, 2025

Organization of equity, diversity and inclusion workshop for all astronomy students, postdocs and faculty at University of Toronto, May 2024

Panel member for Event Horizon Telescope Early Career and faculty application meeting, 2024

Panel member for faculty and postdoc applications at Columbia University, 2022

National Society of Black Physicists | Simons-NSBP mentor for undergraduate scholars fellowship program

Lecture series on black holes for high school students at Pater Damian High School, Eupen, Belgium, 2022

Invited lectures series for Michigan Math and Science Scholars, to introduce high school students to current developments and research in the sciences, University of Michigan, Ann Arbor, US, July 2020

Invited public talk at the public observatory Cozmix, Bruges, Belgium, October 2017

Outreach activities for prospect bachelor students in mathematics and physics at KU Leuven University, development of experiments and tour of the campus

Outreach activity for annual ladies@science event to promote women in science at KU Leuven University, development of experiments for prospect female bachelor students,
<https://set.kuleuven.be/en/news/ladies-science-2018>

Providing promotional material from simulations for Lynx X-Ray Observatory, <https://www.lynxobservatory.com/downloads>

Providing simulation data for ADS/CFT themed concert by Valery Vermeulen at the Concertgebouw Bruges,
<https://www.concertgebouw.be/en/seismik-mikromedas>

Talks and Colloquia

Invited talks

Invited talk at GPAP-DAP Symposium on Plasma Astrophysics at the APS Global Physics Summit, Atlanta, US, April 2027

Invited Colloquium at Tsinghua University, December 2026

Invited talk at International Symposium on Relativistic Astrophysics, Shanghai, China, December 2026

Invited Colloquium in the department of Physics, Engineering Physics and Astronomy at Queen's University, October 2026

Invited Physics and Astronomy colloquium at Northwestern University, Chicago, May 2026

Invited High energy astro seminar at University of Chicago, May 2026

Invited seminar Data Science Initiative at University of Toronto, April 2026

Invited talk at Center for Computational Relativity and Gravitation, Rochester Institute of Technology, Rochester, April 2026

Invited talk at Multi-Messenger Astrophysics in the Dynamic Universe, Yukawa Institute for Theoretical Physics, Kyoto University, Japan, February 2026

Invited colloquium Black Hole Initiative, Harvard University, April 2026

Invited Theoretical High Energy Astrophysics seminar, Columbia University, December 2025

Invited seminar Institute for Advanced Study, Princeton, December 2025

Invited seminar Bar-Ilan University AstroPhysics seminar, November 2025

Invited colloquium at Physics Department at University of Wisconsin Madison, October 2025

Invited seminar at Kavli Institute for Theoretical Physics, program on Extreme Plasma Physics, September 2025

Invited seminar at Nicolaus Copernicus Astronomical Center of the Polish Academy of Sciences, July 2025

Invited colloquium at Astronomy and Astrophysics Department at University of Chicago, April 2025

Invited colloquium at Physics Department at New York University, April 2025

Invited colloquium at Center for Computational Astrophysics, Flatiron Institute, April 2025

Invited talk at "Feeling the pull and the pulse of relativistic magnetospheres" at the Les Houches School of Physics in France, April 2025

Invited colloquium at Astrophysics, Astronomy and Mechanics at the Department of Physics of the University of Athens, June 2024

Invited talk at International Space Science Institute meeting on 50 years of accretion, Bern, Switzerland, June 2024

Keynote lecture at Canadian Society for Mechanical Engineering and Computational Fluid Dynamics Society of Canada joint conference, Toronto, Canada, May 2024

Invited talk at Fifth Purdue Workshop on Relativistic Plasma Astrophysics, Purdue, US, May 2024

Invited colloquium at the Anton Pannekoek Institute, University of Amsterdam, March 2024

Invited astrophysics seminar at Queen's University, January 2024

Invited colloquium at The Max Planck Institute for Radio Astronomy Colloquium, December 2023

Invited talk at CCA Stars and Plasma Astrophysics meeting, December 2023

Invited colloquium at Columbia University Astronomy Colloquium, December 2023

Invited talk at Texas symposium, Shanghai, December 2023

Invited colloquium at Astronomy Colloquium, University of Toronto, October 2023

Invited colloquium at McGill Physical Society Colloquium, October 2023

Invited colloquium at MIT Astrophysics Colloquium, October 2023

Invited tech talk at AMD, August 2023

Invited Seminar at DIFFER, Eindhoven University of Technology, July

2023

Invited talk at ASTRONUM, Pasadena, June 2023

Invited talk at Goddard Space Flight Center, April 2023

Invited Seminar at KU Leuven Institute for Astronomy, Belgium, January 2023

Invited talk at Reconnection and Sgr A* flares workshop, Observatoire de Paris/Section de Meudon, France, January 2023

Invited talk at MPA seminar, Max Planck Institute for Astrophysics, Garching, Germany, October 2022

Invited talk at Nasa Hubble Fellowship Program Fellows Symposium, Baltimore, US, September 2022

Invited talk at GR23 International Conference on General Relativity and Gravitation, Beijing, China, July 2022

Invited colloquium for Copernicus Colloquium Series, July 2022

Invited plenary lecture at 48th EPS Plasma Physics conference, Maastricht, The Netherlands, June 2022

Invited seminar at Universiteit Leiden Institute of Physics, Leiden, the Netherlands, June 2022

Invited talk at Fourth Purdue Workshop on Relativistic Plasma Astrophysics, Purdue, US, May 2022

Invited talk at Event Horizon Telescope Town Hall, virtual, March 2022

Invited talk at Bahcall Lunch, Institute for Advanced Study, Princeton, US, February 2022

Invited talk at Columbia University's theoretical high energy astrophysics seminar, New York, US, February 2022

Invited talk at Black Hole Astrophysics with VLBI: Multi-Wavelength and Multi-Messenger Era conference, Tokyo, Japan, February 2022

Invited talk at CIPS seminar, Boulder, US, January 2022

Invited talk at INAF seminar series, Milan, Italy, December 2021

Invited talk at Miami 2021 on Astrophysical Black Holes and Related Topics, Miami, US, December 2021

Invited talk at ngEHT jets & accretion science working group meeting, virtual, October 2021

Invited talk at Spiegelfest/CCA anniversary, New York, US, October 2021

Invited talk at Princeton-AstroPlasmas Seminar, Princeton, US, October 2021

Invited talk at Regular black holes in quantum gravity and beyond - from theory to shadow observations meeting, London, UK, October 2021

Invited talk at ISSI workshop on Spin evolution of accretion-powered pulsars in high-mass X-ray binaries, International Space Science Institute, Bern, Switzerland, September 2021

Invited talk at Perimeter Institute Strong Gravity Seminar Series, Waterloo, Canada, September 2021

Invited talk at Munich Institute for Astro- and Particle Physics High-Energy Plasma Phenomena in Astrophysics meeting, Munich, Germany, July 2021

Invited talk at the sixteenth Marcel Grossmann meeting, Rome, Italy, July 2021

Invited talk at 47th EPS Plasma Physics conference, Sitges, Spain, June 2021

Invited talk at Bahcall Lunch, Institute for Advanced Study, Princeton, US, April 2021

Invited talk at the JPP Frontiers of Plasma Physics Colloquium, virtual, March 2021

Invited talk at the annual meeting of Max Planck - Princeton Center for plasma physics, Princeton, US, January 2021, recorded: https://drive.google.com/file/d/1qrMFtpLc_BglbG80OZto0YvUMK5i594S/

Invited talk at the Event Horizon Telescope 2020 virtual collaboration meeting, December 2020

Invited talk at The Frontiers of Event Horizon Scale Accretion conference, Kavli Institute for Theoretical Physics, Santa Barbara, US, October 2020, recorded: <https://online.kitp.ucsb.edu/online/accretion-oc20/ripperda/>

Invited talk at AAS HEAD virtual seminar series, September 2020, recorded: <https://www.youtube.com/watch?v=gfwgjIfjuUg&feature=youtu.be>

Invited talk at ABCD workshop, Leuven, Belgium, September 2020

Invited talk at the Event Horizon Telescope Sgr A* Theory Symposium, September 2020

Invited talk at Center for Computational Astrophysics Lunch Talks, New York, US, July 2020

Invited talk at Gravity Initiative Lunch, Princeton, US, February 2020

Invited talk at MIT PSFC Theory Seminar, Cambridge, US, February 2020

Invited talk at Harvard ITC Luncheon, Cambridge, US, February 2020

Invited talk at Harvard CfA High-Energy Phenomena Seminar, Cambridge, US, February 2020,
recorded: <https://www.youtube.com/watch?v=344TcsZ0qtQ&t=3625s>

Invited talk at Horizon Collaboration Meeting, New York, US, January 2020

Invited talk at GRPIC Workshop, Grenoble, France, November 2019

Invited talk at AMRVAC/BHAC workshop, Amsterdam, The Netherlands, August 2019

Invited talk at GRPIC Workshop, New York, US, March 2019

Invited talk at Palaver Seminar, Frankfurt, Germany, December 2018

Invited talk at AstroCoffee seminar, Frankfurt, Germany, February 2018

Invited talk at Princeton-AstroPlasmas Seminar, Princeton, US, January 2018

Invited talk, public observatory Cozmix, Bruges, Belgium, October 2017

Invited talk at Princeton-AstroPlasmas Seminar, Princeton, US, September 2017

Invited Talk at Harvard Black Hole Initiative, Cambridge, US, September 2017

Invited talk at Columbia High-Energy Astrophysics Seminar, New York, US, July 2017

Invited talk at Princeton-AstroPlasmas Seminar, Princeton, US, July 2017

Invited talk at AstroCoffee seminar, Frankfurt, Germany, January 2017

Invited talk at Culham Centre for Fusion Energy, Oxford, UK, November 2011

Contributed talks

Talk at Joint Space Institute meeting on Winds throughout the Universe, Annapolis, October 2023

Talk at AAS HEAD meeting, Hawaii, April 2023

Talk at BLAST (BLack Holes Across Space and Time) workshop, Boston, December 2021

Talk at ngEHT Science Meeting, virtual meeting, November 2021

Talk at IAU symposia Predictive Power of Computational Astrophysics as a Discovery Tool, virtual meeting, November 2021

Talk at 63rd APS DPP, Pittsburgh, US, November 2021

Talk at Jets 2021: Extragalactic jets on all scales - launching, propagation, termination conference, Heidelberg, Germany, June 2021

Talk at Polarized Radiation near Supermassive Black Holes, PCTS workshop, Princeton, US, May 2021

Talk at ngEHT Science meeting, virtual meeting, February 2021

Talk at IAU symposia Challenges and innovations in computational astrophysics - II, virtual meeting, November 2020

Talk at APS DPP Mini-conference, Fort Lauderdale, US, October 2019

Talk at 61st APS DPP, Fort Lauderdale, US, October 2019

Talk at BlackHoleCam Theory Workshop, Nijmegen, The Netherlands, August 2018

Talk at ASTRONUM, Panama City Beach, US, June 2018

Talk at Dutch Astronomers Conference, Groningen, The Netherlands, May 2018

Talk at CHARM meeting 2017, Brussels, Belgium, March 2017

Talk at 43rd EPS Plasma Physics conference, Leuven, Belgium, July 2016

Talk at Dutch Astronomers Conference, Nunspeet, The Netherlands, May 2015

Contributed posters Poster at Accretion in Strong Gravity seminar, Bad Honnef, Germany, February 2019

Poster at Dutch Astronomers Conference, Nunspeet, The Netherlands, May 2016

Poster at NORDITA summer school on Magnetic Reconnection, Stockholm, Sweden, August 2015

Poster at 25th Symposium Plasma Physics and Radiation Technology, Lunteren, The Netherlands, March 2013

Research

<i>Primary Interests</i>	Astrophysics: black hole physics, binary neutron stars, pulsars, magnetars, accretion, jets, flares, gravitational waves, electromagnetic counterparts, precursors, dark matter, cosmology Plasma Physics: magnetic reconnection, instabilities, turbulence, particle acceleration mechanisms, waves, radiation
<i>Methods</i>	Theory: general relativity, magnetohydrodynamics, kinetic physics, fluid dynamics, radiation dynamics, quantum field theory, string theory Numerical: computational hydrodynamics and magnetohydrodynamics, particle-in-cell, numerical relativity, Monte-Carlo techniques

Collaborators and Advisors

<i>Collaborators</i>	E. Quataert (Princeton University), A. Beloborodov (Columbia University), Christopher Thompson (University of Toronto), Amir Levinson (Tel Aviv), Roger Blandford (Stanford University), J. Stone (IAS), R. Keppens, (KU Leuven), O. Porth (University of Amsterdam), L. Sironi (Columbia University), A. Philippov (University of Maryland), J. Teunissen (CWI Amsterdam), F. Bacchini (KU Leuven), T. Hertog (KU Leuven), D. Mayerson (KU Leuven), J. Davelaar (Princeton University), E. Most (Caltech), A. Bhattacharjee (Princeton University), J. TenBarge (Princeton University), J. Juno (Maryland), M. Liska (Georgiatech), A. Bransgrove (Princeton University), D. Groselj (KU Leuven), J. Nättilä (Columbia University/Flatiron Institute), A. Chernoglazov (Princeton University), S. Markoff (University of Amsterdam), K. Chatterjee (Harvard), Y. Yuan (Flatiron Institute), S. Selvi (Columbia University), D. Fielding (NYU)
<i>Graduate Advisors</i>	R. Keppens (KU Leuven), G. Lapenta (KU Leuven)
<i>Postdoc Mentors</i>	A. Philippov (Flatiron Institute), Y. Levin (Flatiron Institute/Columbia University), J. Stone (Institute for Advanced Study), E. Quataert (Princeton University)

Publications

Citations (as of September 1 2026): **23496**

H-index (as of September 1 2026): **44**

Orcid ID: <https://orcid.org/0000-0002-7301-3908>

Top five cited papers with major contribution (excluding Event Horizon Telescope papers):

1. **B. Ripperda**, M. Liska, K. Chatterjee, G. Musoke, A.A. Philippov, A. Tchekhovskoy,

- Z. Younsi, S.B. Markoff, *Black hole flares: ejection of accreted magnetic flux regulated by plasmoid-mediated reconnection*, ApJ Letters (2022), 924, L32, DOI: <https://doi.org/10.3847/2041-8213/ac46a1>
2. **B. Ripperda**, F. Bacchini, A. Philippov, *Magnetic reconnection and hot spot formation in black hole accretion disks*, ApJ (2020), 900, 2, DOI: <https://doi.org/10.3847/1538-4357/ababab>
3. **B. Ripperda**, F. Bacchini, O. Porth, E.R. Most, H. Olivares, A. Nathanail, L. Rezzolla, J. Teunissen, R. Keppens, *General relativistic resistive magnetohydrodynamics with robust primitive variable recovery for accretion disk simulations*, ApJS (2019), 244, 1, DOI: <https://doi.org/10.3847/1538-4365/ab3922>
4. A. Bransgrove, **B. Ripperda**, A.A. Philippov, *Magnetic hair and reconnection in black hole magnetospheres*, PRL (2021), 127, 055101, DOI: <https://doi.org/10.1103/PhysRevLett.127.055101>
5. **B. Ripperda**, F. Bacchini, J. Teunissen, C. Xia, O. Porth, L. Sironi, G. Lapenta, R. Keppens, *A comprehensive comparison of relativistic particle integrators*, ApJS (2018), 235, 1, DOI: <https://doi.org/10.3847/1538-4365/aab114>

Papers with major contribution: first author papers or work I significantly contributed to. Students and postdocs I advised are underlined.

M. Labaj, S.D. von Fellenberg, S.M. Ressler, **B. Ripperda**, M. Zajacek, *Ghosts of the Minispiral: modeling the hidden black hole population of the Galactic Center*, submitted to MNRAS Letters (2026)

G. Musoke, **B. Ripperda**, A. Philippov, O. Porth, M.T.P. Liska, K. Nalewajko, B. Seefeldt-Gail, *How to truncate an accretion disk: The role of magnetic reconnection and flux eruptions*, submitted to ApJ Letters (2026)

D. Hagyard, J.R. Beattie, S. Merlini, V. Valenzuela-Villaseca, J. Hare, **B. Ripperda**, *The distribution of mass-density-gradients in compressible magnetohydrodynamic turbulence: implications for plasma refraction in the laboratory and cosmos*, submitted to ApJ (2026)

B. Seefeldt-Gail, S.D. von Fellenberg, K. Chatterjee, G. Musoke, S. Sanchez-Maes, E. Gorbunov, **B. Ripperda**, A. Philippov, S.M. Ressler, J.R. Beattie, S. Praharaj, M.T.P. Liska, *Characterizing Magnetic Flux Tubes in Black Hole Accretion Flows and Their Role in Powering Sgr A* Flares*, submitted to ApJ (2026)

J.R. Beattie, A. Bhattacharjee, E.R. Most, **B. Ripperda**, A. Philippov, R.S. Klessen, S. Cielo, *The kinematic Kelvin–Helmholtz instability-driven dynamo: implications for merging compact objects*, submitted to PRL (2026)

S. Praharaj, M.T.P. Liska, K. Chatterjee, S. Markoff, **B. Ripperda**, L. Sironi, A.S. Lattimer, *Conditions for mass-loading: Investigating jet-disk material exchange in strongly magnetised accretion flows*, submitted to MNRAS (2026)

A.M. Savelli, D. Groselj, **B. Ripperda**, A. Levinson, A. Philippov, N. Murray, *Making Reconnection Cooler: A relativistic resistive magnetohydrodynamics model for radiative*

collisionless reconnection, submitted to ApJ Letters (2026)

M.P. Grehan, C. Thompson, **B. Ripperda**, J.R. Beattie, *Sparking Dynamic, Relativistic Magnetic Reconnection in a Twisted Flux Tube*, submitted to ApJ (2026)

B. Ripperda, M.P. Grehan, A. Moran, S. Selvi, L. Sironi, A. Philippov, A. Bransgrove, O. Porth, *Magnetic reconnection with a 0.1 rate: Charge-starved resistivity in general relativistic magnetohydrodynamics*, submitted to PRL (2026),
DOI: <https://doi.org/10.48550/arXiv.2601.02460>

J.R. Beattie, M. Sokolova, K. Negandhi, **B. Ripperda**, *Compressible Navier–Stokes Flow in Schrödinger-Type Variables*, accepted in Phys. Rev. Research (2026), 8, 033383
DOI: <https://doi.org/10.1103/6gnr-vkx3>

A. Chow, L. Sironi, **B. Ripperda**, A. Levinson, *The baryon content of magnetically arrested black hole disks and jets*, MNRAS (2026), 552, 1,
DOI: <https://doi.org/10.1093/mnras/stag1631>

K. Chatterjee, A. Philippov, A.M. Beloborodov, K. Parfrey, **B. Ripperda**, E.R. Most, *Relativistic Magnetohydrodynamic Simulations of Giant Magnetar Flares*,
ApJ Letters (2026), 2, L45, DOI: <https://doi.org/10.3847/2041-8213/ae8997>

M.P. Grehan, **B. Ripperda**, A.M. Beloborodov, C. Thompson, E.R. Most, *Global Magnetohydrodynamic Simulations of Monster Shocks in Neutron Star Magnetospheres*,
ApJ (2026), 1005, 158, DOI: <https://doi.org/10.3847/1538-4357/ae633a>

K. Nalewajko, M. Kapusta, **B. Ripperda**, A. Philippov, *Distortion of a relativistic jet echoing a magnetic flux eruption*, ApJ (2026), 1003, 174
DOI: <https://doi.org/10.3847/1538-4357/ae6653>

J. Michail et al (incl. **B. Ripperda**), *Detection and Evolution of Linear Polarization of the Galactic Center Transient MAXI J1744-294*, ApJ (2026), 1003, 38,
DOI: <https://doi.org/10.3847/1538-4357/ae5dc8>

J.M. Michail, S.D. von Fellenberg, G.D. Keating, R. Rao, T. Roychowdhury, S.P. Willner, N.M. Ford, D. Haggard, S. Markoff, A. Philippov, **B. Ripperda**, S. Sanchez-Maes, Z. Sumners, G. Witzel, M. Balakrishnan, S. Chandra, K. Hada, M. Garcia Marin, M.A. Gurwell, G.G. Fazio, J.L. Hora, B. Seefeldt-Gail, H.A. Smith, *First Mid-infrared Detection and Modeling of a Flare from Sgr A*. II. Submillimeter Polarimetry and Spectral Energy Distribution*, ApJ (2026), 997, 2,
DOI: <https://doi.org/10.3847/1538-4357/ae25ef>

H. Hakobyan, A. Levinson, L. Sironi, A.A. Philippov, **B. Ripperda**, *Reconnection-driven Flares in M87*: Proton-synchrotron Powered GeV Emission*, ApJ Letters (2025), 995, 2,
DOI: <https://doi.org/10.3847/2041-8213/ae286a>

A. Lalakos, A. Tchekhovskoy, E.R. Most, **B. Ripperda**, K. Chatterjee, M. Liska, *Universal Radial Scaling of Large-Scale Black Hole Accretion for Magnetically Arrested*

And Rocking Accretion Disks, PRD (2025), 112, 123044,
DOI: <https://doi.org/10.1103/zkq5-bj75>

T. Roychowdhury, S.D. von Fellenberg, J.M. Michail, S.P. Willner, N.M. Ford, Z. Summers, S. Sanchez-Maes, T. Do, M. Garcia Marin, S. Markoff, G.G. Fazio, D. Haggard, J.L. Hora, **B. Ripperda**, N.B. Sabha, H.A. Smith, G. Witzel, *Photometric Constraints on Intermediate-mass Black Holes in the Galactic Centre*, Publications of the Astronomical Society of the Pacific (2025), 137, 11
DOI: <https://doi.org/10.1088/1538-3873/ae16d6>

S.M. Ressler, L. Combi, **B. Ripperda**, X. Li, *Black Hole Collisions With Thin Accretion Disks: OJ 287 and Small-Mass-Ratio Supermassive Black Hole Binary Candidates*, ApJ Letters (2025), 993, L22, DOI: <https://doi.org/10.3847/2041-8213/ae11ab>

L. Combi, C. Thompson, D.M. Siegel, A. Philippov, **B. Ripperda**, *Magnetized accretion onto neutron stars: from photon-trapped to neutrino-cooled flows*, ApJ (2025), 987, 1,
DOI: <https://doi.org/10.3847/1538-4357/addc57>

H. Pradhan, K. Makwana, **B. Ripperda**, *Energy conversion and scaling analysis of relativistic magnetic reconnection*, Physics of Plasmas (2025), 32, 112904,
DOI: <https://doi.org/10.1063/5.0281465>

M. Labaj, S.M. Ressler, M. Zajaček, Tomáš Plšek, **B. Ripperda**, Florian Peissker, *Compact stellar systems hosting an intermediate mass black hole: 3D magnetohydrodynamic study of inflow-outflow dynamics*, A&A, 702, A233 (2025),
DOI: <https://doi.org/10.1051/0004-6361/202554982>

S.C. Selvi, O. Porth, **B. Ripperda**, L. Sironi, *On the universality of the split monopole black hole magnetosphere*, ApJ Letters (2025), 988, L33,
DOI: <https://doi.org/10.3847/2041-8213/adeb6c>

M.P. Grehan, T. Ghosal, J.R. Beattie, **B. Ripperda**, O. Porth, F. Bacchini, *Comparison of magnetic diffusion and reconnection in ideal and resistive relativistic magnetohydrodynamics, ideal magnetodynamics and resistive force-free electrodynamics*, PRD (2025), 112, 063046, DOI: <https://doi.org/10.1103/8xf2-x2nq>

M. Janssen, C.-k. Chan, J. Davelaar, I. Natarajan, H. Olivares, **B. Ripperda**, J. Röder, M. Rynge, M. Wielgus, *Deep learning inference with the Event Horizon Telescope I. Calibration improvements and a comprehensive synthetic data library*, A&A (2025) , 698, A60, DOI: <https://doi.org/10.1051/0004-6361/202553784>

S. Solanki, J. Davelaar, **B. Ripperda**, A.A. Philippov, *Modeling of lightcurves from reconnection-powered very high energy flares from M87**, ApJ (2025), 985, 2, DOI: <https://doi.org/10.3847/1538-4357/adcb9>

Y. Kim, E.R. Most, A.M. Beloborodov, **B. Ripperda**, *Black hole pulsars and monster shocks as outcomes of black hole–neutron star mergers*, ApJ Letters (2025), 982, L54
DOI: <https://doi.org/10.3847/2041-8213/adbff9>

- M. Zou, H. Hakobyan, R. Mbarek, **B. Ripperda**, F. Bacchini, L. Sironi, *A New Particle Pusher with Hadronic Interactions for Modeling Multimessenger Emission from Compact Objects*, Phys. Rev. D (2025), 111, 083032
DOI: <https://doi.org/10.1103/PhysRevD.111.083032>
- A. Moran, L. Sironi, A. Levis, **B. Ripperda**, E.R. Most, S. Selvi, *Effective resistivity in relativistic reconnection: a prescription based on fully kinetic simulations*, ApJ Letters (2025), 978, L45, DOI: <https://doi.org/10.3847/2041-8213/ada158>
- L. Salas, M.T.P. Liska, S.B. Markoff, K. Chatterjee, G. Musoke, O. Porth, **B. Ripperda**, D. Yoon, W. Mulaudzi, *Two-temperature treatments in magnetically arrested disk GRMHD simulations more accurately predict light curves of Sagittarius A**, MNRAS (2025). 538, 2, DOI: <https://doi.org/10.1093/mnras/staf240>
- N. Sridhar, **B. Ripperda**, L. Sironi, J. Davelaar, A.M. Beloborodov, *Bulk Motions in the Black Hole Jet Sheath as a Candidate for the Comptonizing Corona*, ApJ (2025), 979, 199, DOI: <https://doi.org/10.3847/1538-4357/ada385>
- S.M. Ressler, L. Combi, **B. Ripperda**, E.R. Most, *Dual Jet Interaction, Magnetically Arrested Flows, and Flares in Accreting Binary Black Holes*, ApJ Letters (2025), 979, L24, DOI: <https://doi.org/10.3847/2041-8213/ad9eb5>
- S.D. von Fellenberg et al (incl. **B. Ripperda** and B. Seefeldt-Gail), *First mid-infrared detection and modeling of a flare from Sgr A**, ApJ Letters (2025), 979, L20
DOI: <https://doi.org/10.3847/2041-8213/ada3d2>
- J.C. Algaba et al (incl. **B. Ripperda**), *Broadband Multi-wavelength Properties of M87 during the 2018 EHT Campaign including a Very High Energy Flaring Episode*, A&A (2024), 692, A140, DOI: <https://doi.org/10.1051/0004-6361/202450497>
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