

# Michael (Misha, Mykhailo) Rashkovetskyi

Postdoctoral researcher in astrophysics (cosmology)  
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## Fields of interest

Large-scale structure: galaxy clustering; cosmic microwave background; Hubble tension; nature of dark energy; primordial Universe

## Employment

- **The Ohio State University** Columbus, OH, USA  
*CCAPP (Center for Cosmology and AstroParticle Physics) Fellow* 2025 – 2028
- **Harvard College Observatory** Cambridge, MA, USA  
*Postdoctoral Fellow* 2025

## Education

- **Harvard University** Cambridge, MA, USA
  - *Ph.D. in Astronomy and Astrophysics* 2020 – 2025
  - *M.A. in Astronomy and Astrophysics, in passing* 2022
    - Thesis: *Enhancing the analysis of the large-scale structure of the Universe for cutting-edge cosmological surveys with two-point correlation function and beyond* (May 2025)
    - Advisor: Prof. Daniel Eisenstein
    - Center for Astrophysics | Harvard & Smithsonian
- **Tel Aviv University** Tel Aviv-Yafo, Israel
  - *B.Sc. in Physics, Summa Cum Laude (GPA: 98/100)* 2019 – 2020
    - Raymond & Beverly Sackler School of Physics & Astronomy
    - Advisor: Dr. Omer Bromberg
- **Moscow Institute of Physics and Technology** Dolgoprudny, Russia
  - *B.Sc. in Applied Mathematics and Physics, unfinished* 2015 – 2018
    - Department of General and Applied Physics
    - Advisor: Prof. Vasily Beskin
- **Richelieu Lyceum** Odesa, Ukraine
  - *High school, specialization in physics* 2010 – 2015

## First-author publications

4. M. **Rashkovetskyi**, D. J. Eisenstein, *et al.*, “Clustering of DESI galaxies split by thermal Sunyaev-Zeldovich effect”, *The Open Journal of Astrophysics* **8** October (2025)a 46033, [arXiv:2508.20904](https://arxiv.org/abs/2508.20904)

3. M. **Rashkovetskyi**, D. Forero-Sánchez, A. de Mattia, D. J. Eisenstein, N. Padmanabhan, H. Seo, A. J. Ross, *et al.*, “Semi-analytical covariance matrices for two-point correlation function for DESI 2024 data”, *J. Cosmology Astropart. Phys.* **2025** January (2025)b 145, [arXiv:2404.03007](#)
2. M. **Rashkovetskyi**, D. J. Eisenstein, *et al.*, “Validation of semi-analytical, semi-empirical covariance matrices for two-point correlation function for early DESI data”, *MNRAS* **524** September (2023) 3894–3911, [arXiv:2306.06320](#)
1. M. **Rashkovetskyi**, J. B. Muñoz, D. J. Eisenstein, and C. Dvorkin, “Small-scale clumping at recombination and the Hubble tension”, *Phys. Rev. D* **104** November (2021) 103517, [arXiv:2108.02747](#)

### First-tier author publications

10. E. A. Zaborowski, P. Taylor, K. Honscheid, A. Cuceu, A. de Mattia, A. Krolewski, M. **Rashkovetskyi**, A. J. Ross, C. To, *et al.*, “ $H_0$  Without the Sound Horizon (or Supernovae): A 2% Measurement in DESI DR1”, October 2025, [arXiv:2510.19149](#)
9. D. Valcin, M. **Rashkovetskyi**, H. Seo, F. Beutler, P. McDonald, A. de Mattia, A. J. Rosado-Marín, A. J. Ross, N. Padmanabhan, *et al.*, “Combined tracer analysis for DESI 2024 BAO”, August 2025, [arXiv:2508.05467](#)
8. U. Andrade, E. Paillas, J. Mena-Fernández, Q. Li, A. J. Ross, S. Nadathur, M. **Rashkovetskyi**, A. Pérez-Fernández, H. Seo, N. Sanders, O. Alves, X. Chen, N. Deiosso, A. de Mattia, M. White, *et al.*, “Validation of the DESI DR2 measurements of baryon acoustic oscillations from galaxies and quasars”, *Phys. Rev. D* **112** October (2025) 083512, [arXiv:2503.14742](#)
7. D. Forero-Sánchez, M. **Rashkovetskyi**, O. Alves, *et al.*, “Analytical and EZmock covariance validation for the DESI 2024 results”, *J. Cosmology Astropart. Phys.* **2025** April (2025) 055, [arXiv:2411.12027](#)
6. J. Yu, A. J. Ross, A. Rocher, O. Alves, A. de Mattia, D. Forero-Sánchez, J.-P. Kneib, A. Krolewski, T. Lan, M. **Rashkovetskyi**, *et al.*, “ELG spectroscopic systematics analysis of the DESI Data Release 1”, *J. Cosmology Astropart. Phys.* **2025** January (2025) 126, [arXiv:2405.16657](#)
5. J. Mena-Fernández, C. Garcia-Quintero, S. Yuan, B. Hadzhiyska, O. Alves, M. **Rashkovetskyi**, H. Seo, N. Padmanabhan, S. Nadathur, C. Howlett, S. Alam, A. Rocher, A. J. Ross, E. Sanchez, M. Ishak, *et al.*, “HOD-dependent systematics for luminous red galaxies in the DESI 2024 BAO analysis”, *J. Cosmology Astropart. Phys.* **2025** January (2025) 133, [arXiv:2404.03008](#)
4. C. Garcia-Quintero, J. Mena-Fernández, A. Rocher, S. Yuan, B. Hadzhiyska, O. Alves, M. **Rashkovetskyi**, H. Seo, N. Padmanabhan, S. Nadathur, C. Howlett, M. Ishak, L. Medina-Varela, P. McDonald, A. J. Ross, Y. Xie, X. Chen, A. Bera, *et al.*, “HOD-dependent systematics in Emission Line Galaxies for the DESI 2024 BAO analysis”, *J. Cosmology Astropart. Phys.* **2025** January (2025) 132, [arXiv:2404.03009](#)
3. J. Moon, D. Valcin, M. **Rashkovetskyi**, C. Saulder, *et al.*, “First detection of the BAO signal from early DESI data”, *MNRAS* **525** November (2023) 5406–5422, [arXiv:2304.08427](#)
2. E. M. Novoselov, V. S. Beskin, A. K. Galishnikova, M. M. **Rashkovetskyi**, and A. V. Biryukov, “Orthogonal pulsars as a key test for pulsar evolution”, *MNRAS* **494** April (2020) 3899–3911, [arXiv:2004.03211](#)
1. V. S. Beskin, A. K. Galishnikova, E. M. Novoselov, A. A. Philippov, and M. M. **Rashkovetskyi**, “So how do radio pulsars slow-down?”, in “*Journal of Physics Conference Series*”, vol. 932, p. 012012. December 2017

## Collaboration publications

19. C. Garcia-Quintero, H. E. Noriega, A. de Mattia, A. Aviles, K. Lodha, D. Chebat, J. Rohlf, S. Nadathur, W. Elbers, *et al.*, “Cosmological implications of DESI DR2 BAO measurements in light of the latest ACT DR6 CMB data”, April 2025, [arXiv:2504.18464](#)
18. DESI Collaboration *et al.*, “DESI DR2 results. II. Measurements of baryon acoustic oscillations and cosmological constraints”, *Phys. Rev. D* **112** October (2025)a 083515, [arXiv:2503.14738](#)
17. DESI Collaboration *et al.*, “DESI DR2 results. I. Baryon acoustic oscillations from the Lyman alpha forest”, *Phys. Rev. D* **112** October (2025)b 083514, [arXiv:2503.14739](#)
16. K. Lodha, R. Calderon, W. L. Matthewson, A. Shafieloo, M. Ishak, J. Pan, C. Garcia-Quintero, D. Huterer, G. Valogiannis, L. A. Ureña-López, N. V. Kamble, D. Parkinson, A. G. Kim, G. B. Zhao, J. L. Cervantes-Cota, J. Rohlf, F. Lozano-Rodríguez, J. O. Román-Herrera, *et al.*, “Extended dark energy analysis using DESI DR2 BAO measurements”, *Phys. Rev. D* **112** October (2025) 083511, [arXiv:2503.14743](#)
15. W. Elbers, A. Aviles, H. E. Noriega, D. Chebat, A. Menegas, C. S. Frenk, C. Garcia-Quintero, D. Gonzalez, M. Ishak, O. Lahav, K. Naidoo, G. Niz, C. Yèche, *et al.*, “Constraints on neutrino physics from DESI DR2 BAO and DR1 full shape”, *Phys. Rev. D* **112** October (2025) 083513, [arXiv:2503.14744](#)
14. DESI Collaboration *et al.*, “Data Release 1 of the Dark Energy Spectroscopic Instrument”, March 2025, [arXiv:2503.14745](#)
13. X. Chen, Z. Ding, E. Paillas, S. Nadathur, H. Seo, S. Chen, N. Padmanabhan, M. White, A. de Mattia, P. McDonald, A. J. Ross, A. Variu, A. Carnero Rosell, B. Hadzhiyska, M. M. S. Hanif, D. Forero-Sánchez, *et al.*, “Extensive analysis of reconstruction algorithms for DESI 2024 baryon acoustic oscillations”, November 2024, [arXiv:2411.19738](#)
12. DESI Collaboration *et al.*, “DESI 2024 II: sample definitions, characteristics, and two-point clustering statistics”, *J. Cosmology Astropart. Phys.* **2025** July (2025)a 017, [arXiv:2411.12020](#)
11. DESI Collaboration *et al.*, “DESI 2024 V: Full-Shape galaxy clustering from galaxies and quasars”, *J. Cosmology Astropart. Phys.* **2025** September (2025)b 008, [arXiv:2411.12021](#)
10. DESI Collaboration *et al.*, “DESI 2024 VII: cosmological constraints from the full-shape modeling of clustering measurements”, *J. Cosmology Astropart. Phys.* **2025** July (2025)c 028, [arXiv:2411.12022](#)
9. A. Pérez-Fernández, L. Medina-Varela, R. Ruggeri, M. Vargas-Magaña, H. Seo, N. Padmanabhan, M. Ishak, *et al.*, “Fiducial-cosmology-dependent systematics for the DESI 2024 BAO analysis”, *J. Cosmology Astropart. Phys.* **2025** January (2025) 144, [arXiv:2406.06085](#)
8. U. Andrade, J. Mena-Fernández, H. Awan, A. J. Ross, S. Brieden, J. Pan, A. de Mattia, *et al.*, “Validating the galaxy and quasar catalog-level blinding scheme for the DESI 2024 analysis”, *J. Cosmology Astropart. Phys.* **2025** January (2025) 128, [arXiv:2404.07282](#)
7. DESI Collaboration *et al.*, “DESI 2024 III: baryon acoustic oscillations from galaxies and quasars”, *J. Cosmology Astropart. Phys.* **2025** April (2025)a 012, [arXiv:2404.03000](#)
6. DESI Collaboration *et al.*, “DESI 2024 IV: Baryon Acoustic Oscillations from the Lyman alpha forest”, *J. Cosmology Astropart. Phys.* **2025** January (2025)b 124, [arXiv:2404.03001](#)

5. DESI Collaboration *et al.*, “DESI 2024 VI: cosmological constraints from the measurements of baryon acoustic oscillations”, J. Cosmology Astropart. Phys. **2025** February (2025)c 021, [arXiv:2404.03002](#)
4. E. Paillas, Z. Ding, X. Chen, H. Seo, N. Padmanabhan, A. de Mattia, A. J. Ross, S. Nadathur, C. Howlett, *et al.*, “Optimal reconstruction of baryon acoustic oscillations for DESI 2024”, J. Cosmology Astropart. Phys. **2025** January (2025) 142, [arXiv:2404.03005](#)
3. S. F. Chen, C. Howlett, M. White, P. McDonald, A. J. Ross, H. J. Seo, N. Padmanabhan, *et al.*, “Baryon acoustic oscillation theory and modelling systematics for the DESI 2024 results”, MNRAS **534** October (2024) 544–574, [arXiv:2402.14070](#)
2. DESI Collaboration *et al.*, “Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument”, AJ **167** February (2024)a 62, [arXiv:2306.06307](#)
1. DESI Collaboration *et al.*, “The Early Data Release of the Dark Energy Spectroscopic Instrument”, AJ **168** August (2024)b 58, [arXiv:2306.06308](#)

## Outreach and teaching

- **DESI redshift-space distortions animations** with Claire Lamman+  
*Early version used in the press-release and following news articles* Nov 19, 2024 – Mar 2, 2025
- **Astronomy 200: Radiative Processes in Astrophysics** Harvard University  
*Teaching Fellow* Fall 2023
- **Astronomy 201: Astrophysical Fluids & Plasmas** Harvard University  
*Teaching Fellow* Spring 2023
- **Astronomy 130: Introduction to Cosmology** Harvard College  
*Teaching Fellow* Fall 2022

## Seminar talks

- **Ohio University Astro Seminar** Athens, OH, USA  
*Enhancing the analysis of the large-scale structure of the Universe* October 8, 2025
- **CCAPP Fellows Symposium 2025** Columbus, OH, USA  
*Clustering of DESI galaxies split by thermal Sunyaev-Zeldovich effect* September 17, 2025
- **KIPAC Tea (Stanford)** Menlo Park, CA, USA  
*Fast semi-analytical covariance matrices for 2-point correlation functions* May 10, 2024
- **ITC Luncheon** Cambridge, MA, USA  
*Semi-analytic covariance matrices for 2PCF of DESI galaxies (on YouTube)* September 28, 2023

## Contributed conference talks

- **28th International Conference on Particle Physics & Cosmology** Pittsburgh, PA, USA  
*Clustering of DESI galaxies split by thermal Sunyaev-Zeldovich effect* October 16, 2025
- **APS Global Physics Summit** Anaheim, CA, USA  
*Clustering of DESI LRG selected based on ACT DR6 + Planck tSZ map* March 18, 2025

- **IX Essential Cosmology for the Next Generation** Playa del Carmen, Mexico  
*Clustering of DESI galaxies selected based on ACT thermal SZ map* December 5, 2024
- **Cosmology from Home 2023** online  
*First Detection of the BAO Signal from Early DESI Data (on YouTube)* July 4, 2023  
*Co-presenter with Christoph Saulder, Jeongin Moon and David Valcin*
- **APS April Meeting** Minneapolis, MN, USA  
*First Detection of the BAO Signal from Early DESI Data* April 18, 2023

## Poster presentations

- **Arizona Winter School on Multi-Probe Cosmology** Tucson, AZ, USA  
*Clustering of DESI galaxies split by thermal Sunyaev-Zeldovich effect* January 12-15, 2025  
*Second best poster prize*
- **Frontiers in Cosmology and Gravitational Physics** Portsmouth, UK  
*Fast semi-analytical covariance matrices for 2PCF of galaxies and quasars* May 20-23, 2024
- **VIII Essential Cosmology for the Next Generation** Playa del Carmen, Mexico  
*RascalC: Empirical 2PCF Covariance Matrices without Mocks* Nov 30 - Dec 3, 2022
- **CMB-S4 Summer Meeting** online  
*Small-scale Clumping at Recombination and the Hubble Tension* August 9-13, 2021
- **CMB-S4 Spring Meeting** online  
*Hubble Tension with Small-Scale Clumping* March 8-12, 2021
- **Physics of Neutron Stars - 2017** Saint-Petersburg, Russia  
*On the light-curve anomalies of radio pulsars* July 10-14, 2017

## Other meetings

- **DESI December** Tucson, AZ, USA  
*DESI Collaboration* December 8-11, 2025
- **DESI July** Berkeley, CA, USA  
*DESI Collaboration* July 8-11, 2025
- **DESI December** Cancún, Mexico  
*DESI Collaboration* December 10-13, 2024
- **DESI July** Marseille, France  
*DESI Collaboration* July 9-12, 2024
- **Fundamental Physics from Future Spectroscopic Surveys** Berkeley, CA, USA  
*Lawrence Berkeley National Laboratory* May 6-8, 2024
- **DESI December** Waikoloa, HI, USA  
*DESI Collaboration* December 11-14, 2023
- **DESI July** Durham, UK  
*DESI Collaboration* July 17-21, 2023
- **2nd Michigan Cosmology Summer School** Ann Arbor, MI, USA  
*University of Michigan* June 5-9, 2023
- **DESI December** Cancún, Mexico  
*DESI Collaboration* December 5-9, 2022

- **DESI June** Berkeley, CA, USA  
*DESI Collaboration* June 21-24, 2022
- **15th School of Modern Astrophysics** Dolgoprudny, Russia  
*Moscow Insitute of Physics and Technology* July 1-12, 2019
- **13th School of Modern Astrophysics** Dolgoprudny, Russia  
*Moscow Insitute of Physics and Technology* July 3-21, 2017
- **International School of Subnuclear Physics - 2017** Erice, Italy  
*"Ettore Majorana" Foundation and Centre for Scientific Culture* June 14-23, 2017
- **International school on particles, fields and strings** Moscow, Russia  
*National Research University "High School of Economics"* April 17-24, 2017
- **Astronomical practice** Nizhniy Arkhyz, Russia  
*Special Astrophysical Observatory* June 25 – July 2, 2016

## Awards, grants and honors

Dean's Certificate in Recognition of Outstanding Academic Achievements (TAU) . . . . 2019–2020  
 Stipend for excellent students of MIPT in the name of A.Abramov . . . . . 2016–2017  
 International Physics Olympiad, bronze medal . . . . . Mumbai, 2015  
 International Physics Olympiad, silver medal . . . . . Astana, 2014

## Selected open source contributions (<https://github.com/misharash>)

- RASCALC C++ & Python  
*Fast semi-analytic covariance matrices library/program* 2022-2024
- RASCALC scripts Python  
*DESI covariance matrix pipeline for 2-point correlation function (scripts)* 2024
- PYCORR Python  
*Library for 2-point correlation function estimation* 2024

## Languages

- Russian: native
- Ukrainian: fluent
- English: advanced
- Hebrew: advanced
- German: intermediate