

Przemysław (Przemek) Mróz

Adiunkt (Assistant Professor)
Astronomical Observatory, University of Warsaw
Al. Ujazdowskie 4
00-478 Warszawa, Poland

Email: pmroz@astrouw.edu.pl
Web: <https://astrouw.edu.pl/~pmroz/>

Scientific Career

2021 – present	Adiunkt (Assistant Professor), University of Warsaw
2021 – present	member of the <i>Roman</i> Galactic Exoplanet Survey Science Investigation Team
2019 – 2021	Postdoctoral Scholar in Astronomy in the Division of Physics, Mathematics and Astronomy, California Institute of Technology
02/2019 – 05/2019	Visiting Student Researcher in IPAC, California Institute of Technology
2015 – 2019	PhD student at the Astronomical Observatory, University of Warsaw
2013 – present	Team member of the Optical Gravitational Lensing Experiment (OGLE)
2010 – 2015	M.Sc. student at the Faculty of Physics, University of Warsaw

Education

PhD in Astronomy (with distinction), Astronomical Observatory, University of Warsaw, 2019
Dissertation: “Astrophysical applications of gravitational microlensing in the Milky Way”
Supervisor: Professor Andrzej Udalski
M.Sc. in Astronomy, Faculty of Physics, University of Warsaw, 2015
B.Sc. in Astronomy (under Individual Study Program), Faculty of Physics,
University of Warsaw, 2013

Publications (selected)

1. **Mróz, P.**, Udalski, A., Szymański, M. K., et al. *No massive black holes in the Milky Way halo*, *Nature*, DOI:10.1038/s41586-024-07704-6 (2024).
2. **Mróz, P.**, Udalski, A., Szymański, M. K., et al. *Microlensing optical depth and event rate toward the Large Magellanic Cloud based on 20 years of OGLE observations*, *ApJS*, 273, 4 (2024).
3. **Mróz, P.** & Poleski, R. *Exoplanet Occurrence Rates from Microlensing Surveys*. In: Deeg, H.J., Belmonte, J.A. (eds) *Handbook of Exoplanets*. Springer, Cham. DOI:10.1007/978-3-319-30648-3_208-1 (2024).
4. **Mróz, P.**, Ban, M., Marty, P. & Poleski, R. *Free-floating or Wide-orbit? Keck Adaptive-optics Observations of Free-floating Planet Candidates Detected with Gravitational Microlensing*, *AJ*, 167, 40 (2024).
5. Caiazzo, I., ..., **Mróz, P.**, et al. *A rotating white dwarf shows different compositions on its opposite faces*, *Nature*, 620, 61 (2023).
6. **Mróz, P.**, Udalski, A. & Gould, A. *Systematic Errors as a Source of Mass Discrepancy in Black Hole Microlensing Event OGLE-2011-BLG-0462*, *ApJL*, 937, 24 (2022).
7. **Mróz, P.**, Otarola, A., Prince, T., et al. *Impact of the SpaceX Starlink Satellites on the Zwicky Transient Facility Survey Observations*, *ApJL*, 924, 30 (2022).
8. Burdge, K., ..., **Mróz, P.**, et al. *A 62-minute orbital period black widow binary in a wide hierarchical triple*, *Nature*, 605, 41 (2022).
9. **Mróz, P.**, Poleski, R., Gould, A., et al. *A terrestrial-mass rogue planet candidate detected*

- in the shortest-timescale microlensing events*, ApJL, 903, 11 (2020).
10. **Mróz, P.** *Identifying microlensing events using neural networks*, Acta Astron., 70, 169 (2020).
 11. **Mróz, P.**, Udalski, A., Szymański, M. K., et al. *Microlensing optical depth and event rate in the OGLE-IV Galactic plane fields*, ApJS, 249, 16 (2020).
 12. **Mróz, P.**, Poleski, R., Han, C., et al. *A free-floating or wide-orbit planet in the microlensing event OGLE-2019-BLG-0551*, AJ, 159, 262 (2020).
 13. Skowron, D. M., Skowron, J., **Mróz, P.**, et al. *A three-dimensional map of the Milky Way using classical Cepheid variable stars*, Science 365, 478 (2019).
 14. **Mróz, P.**, Udalski, A., Skowron, J., et al. *Microlensing optical depth and event rate toward the Galactic bulge from eight years of OGLE-IV observations*, ApJS 244, 29 (2019).
 15. **Mróz, P.**, Udalski, A., Bennett, D. P., et al. *Two new free-floating or wide-orbit planets from microlensing*, A&A, 622, A201 (2019).
 16. **Mróz, P.**, Udalski, A., Skowron, D. M., et al. *Rotation curve of the Milky Way from Classical Cepheids*, ApJL, 870, 10 (2019).
 17. **Mróz, P.** & Poleski, R. *New Self-lensing Models of the Small Magellanic Cloud: Can Gravitational Microlensing Detect Extragalactic Exoplanets?*, AJ, 155, 154 (2018).
 18. **Mróz, P.**, Ryu, Y.-H., Skowron, J., et al. *A Neptune-mass Free -floating Planet Candidate Discovered by Microlensing Surveys*, AJ, 155, 121 (2018).
 19. **Mróz, P.**, Udalski, A., Skowron, J., et al. *No large population of unbound or wide-orbit Jupiter-mass planets*, Nature, 548, 183 (2017).
 20. **Mróz, P.**, Udalski, A., Bond, I. A., et al. *OGLE-2013-BLG-0132Lb and OGLE-2013-BLG-1721Lb: Two Saturn-mass Planets Discovered around M-dwarfs*, AJ, 154, 205 (2017).
 21. **Mróz, P.**, Han, C., Udalski, A., et al. *OGLE-2016-BLG-0596Lb: A High-mass Planet from a High-magnification Pure-survey Microlensing Event*, AJ, 153, 143 (2017).
 22. **Mróz, P.**, Udalski, A., Pietrukowicz, P., et al. *The awakening of a classical nova from hibernation*, Nature, 537, 649 (2016).
 23. **Mróz, P.**, Udalski, A., Poleski, R., et al. *OGLE Atlas of Classical Novae. II. Magellanic Clouds*, ApJS, 222, 9 (2016).
 24. **Mróz, P.**, Udalski, A., Poleski, R., et al. *One Thousand New Dwarf Novae from the OGLE Survey*, Acta Astron., 65, 313 (2015).
 25. Howes, L. M., ..., **Mróz, P.**, et al. *Extremely metal-poor stars from the cosmic dawn in the bulge of the Milky Way*, Nature, 527, 484 (2015).
 26. **Mróz, P.**, Udalski, A., Poleski, R., et al. *OGLE Atlas of Classical Novae. I. Galactic Bulge Objects*, ApJS, 219, 26 (2015).
 27. **Mróz, P.**, Poleski, R., Udalski, A., et al. *Recurrent and symbiotic novae in data from the Optical Gravitational Lensing Experiment*, MNRAS, 443, 784 (2014).
 28. Gould, A., ..., **Mróz, P.**, et al. *A terrestrial planet in a ~ 1 -AU orbit around one member of a ~ 15 -AU binary*, Science, 345, 46 (2014).

Author and co-author of **280** refereed publications, including **26** as the first author.

Author of 27 ATels. Total number of citations: **8409** (according to the SAO/NASA Database).

My H-index is **49** (according to the SAO/NASA Database).

Observing experience

I am a very experienced observer. In total, I spent 324 nights at the 1.3-m Warsaw (OGLE) Telescope at Las Campanas Observatory in Chile, as well as 15 nights at Keck (NIRC-2, LRIS, ESI, HIRES). I was a PI or CoI of several projects on the largest telescopes, including VLT, Keck, Gemini, and SALT.

Grants

- 2024: SONATA grant of the Polish National Science Center (project: Shedding Light on the Dark Milky Way: from Dark Matter to Astrophysical Black Holes)
- 2021: OPUS grant of the Polish National Science Center (project: Measuring the abundance of massive black holes in the Milky Way halo)
- 2020: NASA TESS Guest Investigator Program “Discovering black holes in detached binary systems” (PI)
- 2018: ETIUDA scholarship of the Polish National Science Center (project: Astrophysical applications of gravitational microlensing in the Milky Way)
- 2014: “Diamond Grant” of the Polish Ministry of Science and Higher Education

Awards

- 2023: University of Warsaw Rector’s prize for scientific achievements
- 2023: Scholarship of the Polish Minister of Education and Science for young scientists
- 2020: Nicolaus Copernicus Award of the Polish Academy of Arts and Sciences
- 2020: Polish Prime Minister Prize for Remarkable Scientific Achievements (for the OGLE team)
- 2020: Frank Wilczek Award
- 2020: International Astronomical Union PhD Prize
- 2018: START fellowship of the Foundation for Polish Science (with distinction)
- 2017: Polish Astronomical Society *Young Scientist Award*
- 2016: Bardadin-Otwinowska Award for the best original M.Sc. thesis prepared at the Faculty of Physics, University of Warsaw
- 2013, 2014: Minister of Science and Higher Education’s scholarship
- 2009, 2010: Scholarship of the Prime Minister, Minister of Education’s scholarship
- 2010: Absolute Winner of the 4th International Olympiad on Astronomy and Astrophysics, Beijing, China
- 2009: Gold Medal in the 3rd International Olympiad on Astronomy and Astrophysics, Tehran, Iran

Seminar presentations

- 05/2024: Polish Academy of Arts and Sciences, Kraków, Poland
- 05/2024: Center for Theoretical Physics, Polish Academy of Sciences, Warszawa, Poland
- 01/2024: Astronomical Observatory of Adam Mickiewicz University, Poznań, Poland
- 08/2022: Korea Astronomy and Space Science Institute, Daejeon, South Korea
- 03/2022: Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences, Toruń, Poland
- 10/2021: Division of Geological and Planetary Sciences, California Institute of Technology, USA
- 04/2021: Ohio State University, Columbus, OH, USA
- 03/2021: Astronomical Observatory, University of Warsaw, Warszawa, Poland
- 01/2021: University of Birmingham, Birmingham, UK

- 11/2020: National Centre for Nuclear Research, Warszawa, Poland
- 10/2020: Astronomical Observatory of the Jagiellonian University, Kraków, Poland
- 07/2019: Heidelberg University, Heidelberg, Germany
- 04/2019: IPAC, California Institute of Technology, CA, USA
- 04/2019: Jet Propulsion Laboratory, California Institute of Technology, CA, USA
- 01/2019: Institute of Physics, Jagiellonian University, Kraków, Poland
- 12/2018: Institute of Astronomy, University of Wrocław, Wrocław, Poland
- 11/2018: Tsinghua Center for Astrophysics, Tsinghua University, Beijing, China
- 05/2018: Astronomical Observatory of Adam Mickiewicz University, Poznań, Poland
- 05/2018: Canada-France-Hawaii Telescope Institute, Hawaii, USA

Conferences, Workshops, & Schools (selected)

- 08/2024: International Astronomical Union General Assembly 2024, Cape Town, South Africa (contributed talk)
- 06/2024: From GRAVITY(+) Towards a Kilometers Baseline, Large Telescope Interferometer, Schloss Ringberg, Germany (invited talk)
- 06/2024: Symbiotic stars, weird novae, and related embarrassing binaries, Prague, Czech Republic (contributed talk)
- 04/2024: SEEC Symposium: Pathways to Characterizing Non-Transiting Planets, NASA Goddard Space Flight Center, Greenbelt, MD, USA (invited talk)
- 03/2024: Roadmap to the next-generation infrared interferometric facility, London, UK (invited talk)
- 01/2024: 26th International Microlensing Conference, Livermore, CA, USA (contributed talk)
- 09/2023: 41st Polish Astronomical Society Assembly, Toruń, Poland (invited talk)
- 07/2023: European Astronomical Society Annual Meeting 2023, Kraków, Poland (contributed talks)
- 09/2022: 25th International Microlensing Conference, Paris, France (contributed talk)
- 08/2022: International Astronomical Union General Assembly 2022, Busan, South Korea (invited and contributed talks)
- 06/2021: European Astronomical Society Annual Meeting 2021, online (contributed talk)
- 02/2021: GRAVITY+ Community Workshop, online (contributed talk)
- 01/2021: 11th OPTICON Gaia Science Alerts workshop, online (contributed talk)
- 11/2020: Exoplanet Demographics, Pasadena, CA, USA (contributed talk)
- 01/2019: 23rd International Microlensing Conference, New York City, NY, USA (contributed talk)
- 04/2018: European Week of Astronomy and Space Science 2018, Liverpool, UK (contributed talks)
- 03/2018: Life on Earth and beyond: emergence, survivability, and impact on the environment, Bertinoro, Italy (invited talk)
- 01/2018: 22nd International Microlensing Conference, Auckland, New Zealand (invited talk)
- 09/2017: 38th Polish Astronomical Society Assembly, Zielona Góra, Poland (invited talk)
- 07/2017: Celebrating 25 years of the OGLE project, Warsaw, Poland (contributed talk)
- 06/2017: Workshop on SALT among the constellations of very large telescopes, Kazimierz Dolny, Poland (poster)
- 02/2017: Ushering in the New Age of Microlensing from Space. 21st International Microlensing

- Conference, Pasadena, CA, USA (contributed talk)
- 01/2016: 20th Microlensing Conference, Paris, France
- 09/2015: The Golden Age of Cataclysmic Variables and Related Objects - III, Palermo, Italy (invited talk)
- 08/2015: iPTF Summer School, Pasadena, CA, USA (poster)
- 09/2012: Summer School on Binary Stars, Leuven, Belgium

Teaching

- Spring 2018: Astronomy II E, class (30 hrs)
- Fall 2017: Theoretical Astrophysics I, class (60 hrs)
- Spring 2017: Astronomy II E, class (30 hrs), Statistics for astronomy, class (30 hrs)
- Spring 2016: Astronomy I E, class (30 hrs)

Miscellaneous

- Reviewer for Nature, Nature Astronomy, Astrophysical Journal, Astronomical Journal, Astronomy & Astrophysics, MNRAS, Acta Astronomica, Astronomische Nachrichten, Research in Astronomy and Astrophysics
- Served on review panels for NASA, European Commission
- Co-author of the report on the impact of satellite constellations on optical astronomy (<https://aas.org/satellite-constellations-1-workshop-report>)
- Junion Member of International Astronomical Union (since 2022)
- *Computer skills*: Python, C/C++, CUDA, bash, L^AT_EX
- *Public outreach*: member of the Scientific Organizing Committee of the Polish Astronomical Olympiad, former member of the International Board of the International Olympiad on Astronomy and Astrophysics (IOAA), Polish team leader at the 5th IOAA (Kraków, Poland, August 2011), 8th IOAA (Suceava, Romania, August 2014), and 12th IOAA (Beijing, China, November 2018)
- My research has been referenced in numerous articles in scientific, popular science and other media, including Nature, Science, Scientific American, New Scientist, Astronomy, Atlantic, National Geographic, New York Times, Los Angeles Times, Guardian, Times, Independent, Spektrum, Frankfurter Allgemeine Zeitung, El Mundo, La Tercera, Polityka, Newsweek, Gazeta Wyborcza, Rzeczpospolita, and others