

Oleh PETRUK

LIST OF REFEREED PUBLICATIONS

(31.03.2025)

[List of publications at ADS](#)

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REFEREED PAPERS

1. M. Patrii, O. Petruk, Spatially resolved X-ray spectra of the remnant of Kepler supernova // 2025, J.Phys.Studies, 29 (2), in press
2. O. Petruk, M. Patrii, T. Kuzyo, A. Baldyniuk, V. Marchenko, V. Beshley, Three-dimensional velocity fields in the silicon- and sulfur-rich ejecta in the remnant of Tycho supernova // 2025, J.Phys.Studies, 29 (1), 1901, <https://doi.org/10.30970/jps.29.1901>
3. V. Sapienza, M. Miceli, O. Petruk, A. Bamba, S. Katsuda, S. Orlando, F. Bocchino, T. DeLaney, Time evolution of the synchrotron X-ray emission in Kepler's SNR: the effects of turbulence and shock velocity // 2024, ApJ, 973, 105, <https://doi.org/10.3847/1538-4357/ad6566>
4. CTA Consortium (incl. O.Petruk), Dark Matter Line Searches with the Cherenkov Telescope Array // 2024, JCAP, 7, 47, <https://doi.org/10.1088/1475-7516/2024/07/047>
5. O. Petruk, T. Kuzyo, M. Patrii, L. Chomiuk, M. Arias, M. Miceli, S. Orlando, F. Bocchino, Evidence of gradients of density and magnetic field in the remnant of Tycho's supernova // 2024, ApJ, 972, 63, <https://doi.org/10.3847/1538-4357/ad62ff>
6. R. Bandiera, O. Petruk, Synchrotron polarization with a partially random magnetic field: general approach, and application to X-ray polarization from SNRs // 2024, A&A, 689, A137 <https://doi.org/10.1051/0004-6361/202450103>
7. O. Petruk, T. Kuzyo, Individual particle approach to diffusive shock acceleration Effect of the non-uniform flow velocity downstream of the shock // 2024, A&A, 688, A108, <https://doi.org/10.1051/0004-6361/202347803>
8. CTA Consortium (incl. O.Petruk), Prospects for a survey of the galactic plane with the Cherenkov Telescope Array // 2024, JCAP, 10, 81 <https://www.doi.org/10.1088/1475-7516/2024/10/081>
9. CTA Consortium (incl. O.Petruk), Prospects for γ -ray observations of the Perseus galaxy cluster with the Cherenkov Telescope Array // 2024, JCAP, 10, 4 <https://www.doi.org/10.1088/1475-7516/2024/10/004>
10. Sapienza V., Miceli M., Petruk O., Bamba A., Orlando S., Bocchino F., Peres G. Unraveling the Effects of Dense Medium on a Near to Bohm-Limit Acceleration in Kepler's SNR // Proc. of Science, 2023, v.444, id.843 (8 pp.) <https://doi.org/10.22323/1.444.0843>
11. CTA Consortium (incl. O.Petruk), Sensitivity of the Cherenkov Telescope Array to TeV photon emission from the Large Magellanic Cloud // MNRAS, 2023, v.523, p.5353-5387 <https://doi.org/10.1093/mnras/stad1576>
12. CTA Consortium (incl. O.Petruk), Sensitivity of the Cherenkov Telescope Array to spectral signatures of hadronic PeVatrons with application to Galactic Supernova Remnants // Astroparticle Physics, 2023, 150, 102850 (28 pp.) <https://doi.org/10.1016/j.astropartphys.2023.102850>
13. O Petruk, V Beshley, S Orlando, F Bocchino, M Miceli, S Nagataki, M Ono, S Loru, A Pellizzoni, E Egron, Polarized radio emission unveils the structure of the pre-supernova

- circumstellar magnetic field and the radio emission in SN1987A // MNRAS, 2023, v. 518, p. 6377–6389 <https://doi.org/10.1093/mnras/stac3564>
14. B. Novosyadlyj, B. Hnatyk, Yu. Kulinich, B. Melekh, O. Petruk, R. Plyatsko, M. Tsizh, M. Vavrukh and N. Virun, Samuil Kaplan and the development of astrophysical research at the Lviv University // The European Physical Journal H, 2022, v.47, id.12 (25 pp.) <https://doi.org/10.1140/epjh/s13129-022-00045-w>
 15. D. Meyer, P. Velázquez, O. Petruk et al. Rectangular core-collapse supernova remnants: application to Puppis A // MNRAS, 2022, v.515, p.594–605 <https://doi.org/10.1093/mnras/stac1832>
 16. O. Petruk, T. Kuzyo, S. Orlando, M.Pohl, R.Brose, Magneto-hydrodynamic simulations of young supernova remnants and their energy-conversion phase // MNRAS, 2021, MNRAS 505, 755-770 <https://doi.org/10.1093/mnras/stab1319>
 17. Orlando S.; Miceli M.; Ustamujic S.; Tutone A.; Greco E.; Petruk O.; Bocchino F.; Peres G. Modeling particle acceleration and non-thermal emission in supernova remnants // New Astronomy, 2021, Volume 86, article id. 101566 (7 pp.) <https://doi.org/10.1016/j.newast.2020.101566>
 18. CTA Consortium (incl. O.Petruk), Sensitivity of the Cherenkov Telescope Array for probing cosmology and fundamental physics with gamma-ray propagation // Journal of Cosmology and Astroparticle Physics, 2021, issue 2, id.048 <https://doi.org/10.1088/1475-7516/2021/02/048>
 19. CTA Consortium (incl. O.Petruk), Pre-construction estimates of the Cherenkov Telescope Array sensitivity to a dark matter signal from the Galactic centre // Journal of Cosmology and Astroparticle Physics, 2021, issue 1, id.057 <https://doi.org/10.1088/1475-7516/2021/01/057>
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 22. Brose R., Pohl M., Sushch I., Petruk O., Kuzyo T., Cosmic-ray acceleration and escape from post-adiabatic Supernova remnants // Astronomy & Astrophysics, 2020, v.634, id.A59 (11 pp.) <https://doi.org/10.1051/0004-6361/201936567>
 23. CTA collaboration (incl. O.Petruk), Monte Carlo studies for the optimization of the Cherenkov Telescope Array layout // Astroparticle Physics, 2019, v.111, p.35-53 [<https://doi.org/10.1016/j.astropartphys.2019.04.001>]
 24. M. Miceli, S. Orlando, D. Burrows, K. Frank, C. Argiroffi, F. Reale, G. Peres, O. Petruk, F. Bocchino, Collisionless shock heating of heavy ions in SN 1987A // Nature Astronomy, 2019, v.3, p.236-241 [<https://www.nature.com/articles/s41550-018-0677-8>]
 25. S. Orlando, M. Miceli, O. Petruk, M. Ono, S. Nagataki, M. A. Aloy, P. Mimica, S.-H. Lee, F. Bocchino, G. Peres, M. Guarrasi, 3D MHD modeling of the expanding remnant of SN 1987A. Role of magnetic field and non-thermal radio emission // Astronomy & Astrophysics. – 2019. – v.622. – id.A73 (15 pp.) [<https://doi.org/10.1051/0004-6361/201834487>]
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29. O. Petruk, S. Orlando, M. Miceli, F.Bocchino, Linking gamma-ray spectra of supernova remnants to the cosmic ray injection properties in the aftermath of supernovae // Astronomy & Astrophysics. – 2017. – v.605. – A110 [<https://doi.org/10.1051/0004-6361/201730956>]
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35. O. Petruk, T. Kuzyo, V. Beshley, Post-adiabatic supernova remnants in the interstellar magnetic field. Parallel and perpendicular shocks // Monthly Notices of the Royal Astronomical Society. – 2016. – v.456. – P.2343-2353 [<http://mnras.oxfordjournals.org/content/456/3/2343>]
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63. Petruk O. A New Model for the Thermal X-ray Composites and the Neutral Pion Decay Gamma-Rays from Supernova Remnants // *Astrophysical Sources of High Energy Particles and Radiation* / Eds. Wefel J., Shapiro M., Stanev T. – Kluwer Academic Publishers, 2001. – P. 93-100. [<http://adsabs.harvard.edu/abs/2001ashe.conf...93P>]
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[<http://adsabs.harvard.edu/abs/1999A%26A...344..295H>]
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MONOGRAPHS

1. Cosmic Pages. Atlanti stellari negli osservatori astronomici italiani. Edited by I. Chinnici, M. Gargano. Arte'm (Italy), 2022, 176 p. Author of the section: Imaginations of Astronomical Sky in Italian Visual Art, p.32-45. Indice: <https://openaccess.inaf.it/handle/20.500.12386/32794>
2. Astronomy in Lviv University (1661-2021). Lviv, 2021, 368 p. (with coauthors)
3. Leopoldis Scientifica. Exact Sciences in Lviv until the middle of the 20th century. Lviv, 2021. 352 p. (in English language; editor and author of one section). Full text at [Google Books](#)
4. O.Petruk, Astronomy in Lviv University in 1800-1939 (2020, 288 pages, in Ukrainian) ([full text on Google Book](#))
5. CTA Consortium (incl. O.Petruk), Science with the Cherenkov Telescope Array, World Scientific, 2019. 364 p. [<https://doi.org/10.1142/10986>]
6. O.Petruk, Astronomical attractions in Lviv. Guide book (2014, 28 pag., in Ukrainian). Full text at <https://goo.gl/MggCYH>

EDITOR BOOKS

7. 2023 Editor of the archive documents and reprints “Mathematical-natural science-medical section of the Shevchenko Scientific Society. Materials for history. 1893-1939” (2023, 288 pp., in Ukrainian)
8. 2020 Editor of the collection of scientific papers “Leopoldis Scientifica. Science in Lviv till the middle of XX century” (2020; in Ukr.). T.1: Scientific Centers, 336 pp. T.2: Exact Sciences, 412 pp. V.1 [Google Books](#) , V.2 [Google Books](#)
9. 2016 Editor of the collection of scientific papers “Ukrainian sky 2. Studies on History of Astronomy in Ukraine” (2016, 669 pp., in Ukrainian) <http://goo.gl/o0DFWG>
10. 2014 Editor of the collection of scientific papers “Ukrainian sky. Studies on History of Astronomy in Ukraine” (2014, 767 pp., in Ukrainian) <https://goo.gl/HO1W7a>

And also

- 19 refereed papers in Ukrainian (1996-2024)
- about 180 conference abstracts and proceedings (since 2000)

- a number of popular articles in newspapers about Astronomy (2009-2021, in Ukrainian)

Thesis

- Habilitation (second-level Ph.D.) in Astrophysics (2011)
Acceleration of cosmic rays in shell supernova remnants (353 pp., in English).
[<http://iapmm.lviv.ua/12/petruk/dd.pdf>]
- Ph.D. in Astrophysics (2000)
Evolution of supernova remnants in nonuniform interstellar medium (183 pp., in Ukrainian)
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