

Oleh PETRUK

LIST OF REFEREED PUBLICATIONS

(16.03.2024)

[List of publications at ADS](#)

[ORCID profile](#)

REFEREED PAPERS

1. CTA Consortium (incl. O.Petruk), Prospects for a survey of the Galactic plane with the Cherenkov Telescope Array // 2023, submitted to JCAP, <https://doi.org/10.48550/arXiv.2310.02828>
2. CTA Consortium (incl. O.Petruk), Prospects for γ -ray observations of the Perseus galaxy cluster with the Cherenkov Telescope Array // 2023, submitted to JCAP, <https://doi.org/10.48550/arXiv.2309.03712>
3. 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>
4. 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>
5. 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>
6. 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>
7. 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>
8. 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>
9. 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>
10. 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>
11. 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>

12. 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>
13. Petruk, O.; Beshley, V.; Marchenko, V.; Patrii, M. GeV light curves of young supernova remnants // *Journal of Physical Studies*, 2020, v.24, N.3, id.3903 (9 pp.) <https://doi.org/10.30970/jps.24.3903>
14. Orlando, S.; Ono, M.; Nagataki, S.; Miceli, M.; Umeda, H.; Ferrand, G.; Bocchino, F.; Petruk, O.; Peres, G.; Takahashi, K.; Yoshida, T. Hydrodynamic simulations unravel the progenitor-supernova-remnant connection in SN 1987A // *Astronomy & Astrophysics*, 2020, v.636, id.A22 (19 pp.) <https://doi.org/10.1051/0004-6361/201936718>
15. 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>
16. 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>]
17. 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>
18. 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>
19. S. Loru et al. (incl. O.Petruk), Investigating the high-frequency spectral features of SNRs Tycho, W44 and IC443 with the Sardinia Radio Telescope // *Monthly Notices of the Royal Astronomical Society*. – 2019. – v.482.– p.3857-3867 <https://doi.org/10.1093/mnras/sty1194>
20. O.Petruk, T.Kuzyo, S.Orlando, M.Pohl, M.Miceli, F.Bocchino, V.Beshley, R.Brose, Post-adiabatic supernova remnants in an interstellar magnetic field: oblique shocks and non-uniform environment // *Monthly Notices of the Royal Astronomical Society*. – 2018. – v.479. – p.4253-4270 <https://doi.org/10.1093/mnras/sty1750>
21. O. Petruk, R. Bandiera, V. Beshley, S. Orlando, M. Miceli, Radio polarization maps of shell-type SNRs II. Sedov models with evolution of turbulent magnetic field // *Monthly Notices of the Royal Astronomical Society*. – 2017. – v.470. – P.1156-1176 <https://doi.org/10.1093/mnras/stx1222>
22. 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>
23. F. Acero et al., Prospects for Cherenkov Telescope Array Observations of the Young Supernova Remnant RX J1713.7-3946 // *Astrophysical Journal*. – 2017. – v.840. – id.74 (14pp) <https://doi.org/10.3847/1538-4357/aa6d67>
24. O. Petruk, S. Orlando, M. Miceli, Linking supernovae and supernova remnants. Time-dependent injection in SN1987A and gamma-ray spectrum of IC443 // "SN 1987A, 30 years later", *Proceedings IAU Symposium No. 331*. – 2017. – v.12. – p.268-273 <https://doi.org/10.1017/S1743921317004367>
25. Orlando S., Miceli M., Petruk O. Bridging the gap between supernovae and their remnants through multi-dimensional hydrodynamic modeling // "SN 1987A, 30 years later",

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[<http://mnras.oxfordjournals.org/content/456/3/2343>]
29. O. Petruk, Particle acceleration at shocks. Stationary solutions of kinetic equation (comprehensive review, in Ukrainian) // Journal of Physical Studies. – 2014. – v. 18, part 1. – id. 1901 (18 p.) [<https://physics.lnu.edu.ua/jps/2014/1/abs/a1901-18.html>]
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35. Petruk O., Kuzyo T., Bocchino F. Constraints on magnetic field strength in the remnant SN1006 from its non-thermal images // Monthly Notices of the Royal Astronomical Society. – 2012. – V. 419. – P. 608–613. [<http://adsabs.harvard.edu/abs/2012MNRAS.419..608P>]
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55. Petruk O. X-rays from Supernova Remnants in 3-D: Models and Effects // Astr. Society of Pacific Conf. Proc. – 2001. – V. 251. – P. 266-267. [<http://adsabs.harvard.edu/abs/2001ASPC..251..266P>]
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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/MqgCYH>

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 “Leopolis 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

- 17 refereed papers in Ukrainian (1996-2022)
- about 150 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).
[\[http://iapmm.lviv.ua/12/petruk/dd.pdf\]](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)
[\[http://iapmm.lviv.ua/12/petruk/kd.pdf\]](http://iapmm.lviv.ua/12/petruk/kd.pdf)