

CURRICULUM VITAE

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Oleh PETRUK

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ADS publication list: [here](#)

AREA OF RESEARCH INTERESTS AND EXPERIENCE

- *Supernova Remnants*
- *Shock waves in nonuniform media*
- *Acceleration of cosmic rays*
- *Non-thermal emission and polarization*
- *Magnetohydrodynamics, simulations and analytical methods*

EDUCATION

2011 *Doctor of Science, Main Astronomical Observatory, Ukraine*

Thesis title: Acceleration of cosmic rays in shell supernova remnants

2000 *PhD (CSc), Main Astronomical Observatory, Ukraine*

Thesis title: Hydrodynamic simulations of supernova remnant evolution in non-uniform medium

1993 *MSc., Physics Faculty, Lviv University, Ukraine*

CURRENT POSITION(S)

Since 2023 *Marie Curie Fellow, INAF-Astronomical Observatory of Palermo, Italy*

Since 2005 *Senior Researcher, Institute for Applied Problems in Mechanics and Mathematics, Lviv, Ukraine*

PREVIOUS POSITION(S)

2022-2023 *Visiting Researcher, Osservatorio Astronomico di Palermo – INAF, Italy*

2016-2017 *Visiting Researcher, Osservatorio Astronomico di Palermo – INAF, Italy*

2012-2013 *Research Fellow, Arcetri Astrophysical Observatory – INAF, Italy*

2003-2004 *Postdoc, Arcetri Astrophysical Observatory – INAF, Florence, Italy*

1993-2005 *Engineer, Researcher (since 2000), Institute for Applied Problems in Mechanics and Mathematics, Lviv, Ukraine*

AWARDS AND SCHOLARSHIPS

2023-2025 *MSCA4Ukraine fellowship in the frame of the EU Marie Curie Action*

2023 *Commemorative medal on behalf of 150 anniversary of Shevchenko Scientific Society, Ukraine*

2022-2023 *Fellowship from Direzione Scientifica of Istituto Nazionale di Astrofisica, Italy*

2022 *Fellowship in the frame of HPC-Europa3 Transnational Access program, Italy*

2021, 2009, 2008 *Award for the advisor of the undergraduate student's scientific works, the second places (each time) in Astronomy at the national competition, Ukraine*

2020 *Prize for advanced scientists, Lviv Regional Council, Ukraine*

2020, 2017 *Awards for achievements in popularization of science and culture, Lviv Municipality, Ukraine*

2018 *Medal "For professional results", National Academy of Science, Ukraine*

2017 *Scholarship for the Conference "SN1987A, 30 years later" (La Reunion, France), International Astronomy Union*

- 2015 *Award for achievements in popularization of Astronomy, Ukrainian Astronomical Society, Ukraine*
- 2011 *Prize for advanced scientists, Lviv Regional Council, Ukraine*
- 2010 *Scholarship for the 40th Saas-Fee Advanced Course "Astrophysics at Very-High Energies", Switzerland*

SCIENTIFIC SUPERVISION

- 2012, 2021 *PhD thesis Supervisor (2 students successfully obtained the PhD title), Institute for Applied Problems in Mechanics and Mathematics, Lviv, Ukraine*
- 2008, 2017, 2021, 2023 *Master thesis Supervisor (4 students), Physics Faculty, Lviv University, Ukraine*
- 2008, 2009, 2021 *Undergraduate student's scientific works, National competition, Ukraine*

TEACHING ACTIVITIES

- 2018, spring *Visiting Professorship, Subject: Supernova Remnants: magnetohydrodynamics and cosmic rays (lectures and seminars), Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University, Poland*

ORGANISATION OF SCIENTIFIC EVENTS

- 2023 *Conference "Astronomy and Space Physics", international, number of participants about 50, Ukraine, member of SOC*
- 2021 *Conference "Astronomy in Lviv University", international, number of participants about 70, Ukraine, member of LOC*
- 2020, 2011, 2008 *International Mathematical Conference, number of participants 188 in 2020 and about 200 in other years, Ukraine, Member of LOC*
- 2018, 2016, 2014 *Conference "Selected Issues of Astronomy and Astrophysics", national, number of participants about 100, Ukraine, member of LOC*
- 2015 *International Mathematical Conference, number of participants about 200, Ukraine, Secretary of LOC*

REVIEWING ACTIVITIES

- 2019-2023 *Member of the Speakers and Publications Office (SAPO) in the CTA Consortium - Cherenkov Telescope Array*
- 2019- *Member of the Editorial Board of Journal of Physical Studies, Ukraine*
- 2020 *Reviewer of PhD theses, Ukraine*
- 2016, 2017 *Reviewer on a national level for scientific projects granted by the Ministry of Education and Science of Ukraine*
- 2015 *Reviewer of Post-doctoral (habilitation) degree dissertation, Ukraine*
- Reviewer for Astronomy & Astrophysics, Astrophysical Journal Letters, Astrophysical Journal, Monthly Notices of the Royal Astronomical Society*

MAJOR COLLABORATIONS

- Cherenkov Telescope Array (CTA) Consortium, Member of the Speakers and Publications Office (SAPO), TeV gamma-rays from cosmic sources*
- Salvatore Orlando, INAF - Osservatorio Astronomico di Palermo, Italy, co-author and co-investigator, MHD simulations of SNRs*
- Marco Miceli, INAF - Osservatorio Astronomico di Palermo, Italy, co-author and co-investigator, analysis of X-ray observations of SNRs*

Rino Bandiera, INAF - Osservatorio Astrofisico di Arcetri, Florence, Italy, co-author and co-investigator, polarization of radio emission from SNRs

Martin Pohl, Deutsches Elektronen-Synchrotron DESY, Zeuthen, Germany, co-author and co-investigator, numerical solutions of the kinetic equation for the shock particle acceleration

SCIENTIFIC VISITS / INTERNATIONAL MOBILITY

05.2023-04.2025 *Marie Curie fellow, Astronomical Observatory, INAF, Palermo, Italy (MSCA4Ukraine fellowship, EU funds)*

05.2022-04.2023 *visiting researcher, Astronomical Observatory, INAF, Palermo, Italy (INAF fellowship)*

02.2022-04.2022 *visiting researcher, Astronomical Observatory, INAF, Palermo, Italy (in the frame of HPC-Europa3 Transnational Access program, EU funds)*

10.2018, 10-11.2015, 04.2015 *visiting researcher, Deutsches Elektronen-Synchrotron DESY, Zeuthen, Germany*

03-06.2018 *visiting professor, Jagiellonian University, Poland*

02.2015, 10.2012, 06.2009 *visiting researcher, Astronomical Observatory, Jagiellonian University, Poland*

09-11.2011, 09-10.2008 *visiting researcher, Astronomical Observatory, INAF, Palermo, Italy*

11.2008, 06.2008, 11.2006 *visiting researcher, Astronomical Observatory, Jagiellonian University, Poland*

SCIENTIFIC PUBLICATIONS

- Refereed papers: 71 (*Scopus*); 96 (*total, including in Ukrainian language*)
- Total citations: 1260 (*Scopus*); 2011 (*Google Scholar*)
- h index 20 (*Scopus*); 23 (*Google Scholar*)
- 160 conference abstracts and proceedings

List of publications is attached

MONOGRAPHS

1) *CTA Consortium (incl. O.Petruk), Science with the Cherenkov Telescope Array, World Scientific, 2019. 364 p.*

2) *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)*

3) *Astronomy in Lviv University (1661-2021). Lviv, 2021, 368 p. (with coauthors, in Ukrainian)*

4) *O.Petruk, Astronomy in Lviv University in 1800-1939 (2020, 288 pages, in Ukrainian)*

5) *Leopolis Scientifica. Exact Sciences in Lviv until the middle of the 20th century. Lviv, 2021. 352 p. (with coauthors, in English)*

PRESENTATIONS AT INTERNATIONAL CONFERENCES / SYMPOSIA (in the last 5 years)

23-26.10.2023, *Anisotropies in core-collapse supernova explosions (Palermo, Italy), speaker*

9-13.10.2023, *Supernova remnants in complex environments (Leiden, Netherlands), speaker*

15-16.06.2023, *INAF USC VIII - Calcolo Critico (Catania, Italy), speaker*

05-08.09.2022, *International conference "3D Supernova (Remnants). How to connect simulations and observations?" (Valencia, Spain), speaker*

14-17.09.2021, *International conference dedicated to 250 years of Astronomical Observatory "Astronomy in Lviv University" (Lviv, Ukraine), Astronomy in Lviv University in 1800-1939, invited speaker*

14-17.09.2021, Dickstein Forum 2021, Polska Akademia Umiejętności (Kraków, Poland), Astronomy in Lviv in the XIX century, speaker

26-30.10.2020, International Mathematical Conference, Institute for Applied Problems in Mechanics and Mathematics (Lviv, Ukraine), Approximations for a solution of the non-stationary equation which describes the non-linear acceleration of particles, speaker

2-3 talks at national conferences in Ukraine each year

RESEARCH PROJECTS

01.2024-12.2025 Particle acceleration at shocks of young supernova remnants: evolution of the spectral index, 17 kEUR, INAF minigrant, Italy

05.2023-04.2025 Evolution of radio emission from the remnant of supernova 1987A by magnetohydrodynamic modeling and comparison with the observations, 186 kEUR, MSCA4Ukraine consortium, EU

11.2022-01.2024 Evolution of radio emission from the remnant of supernova (SN) 1987A by magnetohydrodynamic modeling and comparison with the observations, numerical resources, High-performance computing ISCRA class B project by CINECA, Italy

05.2022-04.2023 Development of 3D MHD models to reproduce the radio emission and polarization of the supernova remnant SN 1987A, 28 kEUR, INAF, Italy

04.2021-12.2023 High-energy processes and manifestations of new physics in astrophysical gamma ray sources, contractor, 4 Mhryvna (125 kEUR), Ministry of Education and Science, Ukraine

01.2020-12.2024 Development and application of topological, differential-geometric, analytical and numerical methods for studying equations of the theory of physical fields and particle motion in Riemannian spaces, contractor, 14 Mhryvna (430 kEUR), National Academy of Science, Ukraine

04.2018-12.2020 Analysis of observational data from the space-based gamma- and X-ray observatories Fermi, Chandra and XMM-Newton, principal investigator, 270 khryvna (8300 EUR), National Academy of Science, Ukraine

2017 Supernova remnant evolution in the nonuniform outskirts of molecular clouds, numerical resources, High-performance computing ISCRA class C project by CINECA, Italy

01.2016-12.2019 Development of methods for studying structures on manifolds associated with groups, algebras and graphs, and development of geometric analysis in relation to the theory of relativistic fields and particles, contractor, 8.8 Mhryvna (272 kEUR), Nat. Acad. of Science, Ukraine

04.2016-12.2018 Numerical simulations of the evolution of young supernova remnants as objects for observations by a network of Cherenkov telescopes, contractor, 200 khryvna (6 kEUR), National Academy of Science, Ukraine

2016 Interactions of supernova remnants with molecular clouds, numerical resources, High-performance computing ISCRA class C project by CINECA, Italy

01.2015-12.2017 Filling the gap between supernova explosions and their remnants through magnetohydrodynamic modelling and high performance computing, contractor, 56 kEUR, National Institute for Astrophysics (INAF), Italy

OTHER ACHIEVEMENTS

2023 Editor of the collection of documents on the history of Mathematical-Natural Science-Medical section of the Shevchenko Scientific Society (2023, 288 p., in Ukr.)

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.

2016 Editor of the collection of scientific papers "Ukrainian sky 2. Studies on History of Astronomy in Ukraine" (2016, 669 pp., in Ukrainian)

2014 Editor of the collection of scientific papers “Ukrainian sky. Studies on History of Astronomy in Ukraine” (2014, 767 pp., in Ukrainian)

OUTREACH

- *Invited lectures on History of Mathematical-Natural Science-Medical Section of Shevchenko Scientific Society, different audiences at few locations (Lviv, Ukraine, 2022, 2023)*
- *“Imaginations of Astronomical Sky in Italian Visual Art”, invited author, a chapter in a book (Italy, 2022)*
- *Invited lectures on Astronomy for general audience (European Heritage Days, Lviv, Ukraine, 2020, 2017, 2015)*
- *Invited lecture on modern status of High-Energy Astrophysics in the National Astronomy Olympiad (Ukraine, 2015)*
- *Lectures on History of Astronomy in Ukraine, National University (Lviv, Ukraine, 2014)*
- *Lectures on History of Astronomy in Lviv, National University (Lviv, Ukraine, 2014-2019)*
- *Invited lectures on current status of Particle and High-energy Astrophysics: for scientists, teachers, students; different institutions (Lviv, Ukraine, 2009-2018)*
- *Guide book about Astronomy in Lviv (2014, 28 pp., in Ukrainian)*
- *Popular articles in newspapers and youth journals (2009-2021)*
- *Interviews and articles on prominent astronomical events in Ukrainian newspapers and radio (2009-2018)*