

Yuliia Mazurenko, Ph.D.

Fulbright Visiting Research Scholar | A.J. Drexel Nanomaterials Institute | Drexel University

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Google Scholar: <https://scholar.google.com/citations?hl=uk&user=Cad7X8UAAAAJ>

RESEARCH PROFILE

Nanomaterials researcher specializing in spinel ferrites, magnetic nanoparticles, photocatalysis, and ferrite-based hybrid composites for environmental and biomedical applications. Current research at Drexel University extends this work to ferrite/MXene hybrid nanocomposites for water purification, emphasizing interfacial engineering, photocatalytic pollutant degradation, adsorption, and magnetic recovery. Recent work also includes electromagnetic shielding materials, and structural analysis. Experienced in international collaborative research, competitive fellowships, scientific publishing, peer review, student mentoring, and research project development.

RESEARCH INTERESTS

Nanostructured spinel ferrites; magnetic nanoparticles; MXenes and ferrite/MXene hybrid nanocomposites; combustion synthesis; structure-property relationships; magnetic, dielectric, and optical properties; photocatalysis and photo-Fenton processes; water purification and environmental remediation; electromagnetic shielding; magnetic nanocomposites.

CURRENT AND RESEARCH APPOINTMENTS

Fulbright Visiting Research Scholar | 2026-Present

A.J. Drexel Nanomaterials Institute, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA

Host: Prof. Yury Gogotsi.

Project: Ferrite/MXene Hybrid Nanocomposites for Water Purification Applications. Developing multifunctional ferrite/MXene systems for removal of organic dyes, pharmaceutical residues, and microplastics, with focus on photocatalysis, interfacial charge transfer, and magnetic recyclability.

Research Scientist | 2025-Present

Joint Research and Educational Laboratory of Magnetic Film Physics, G.V. Kurdyumov Institute for Metal Physics, National Academy of Sciences of Ukraine, and Vasyl Stefanyk Carpathian National University, Ukraine

Research on nanostructured magnetic materials and ferrite-based functional systems; scientific publications, collaborative projects.

FELLOWSHIPS AND INTERNATIONAL RESEARCH EXPERIENCE

PAN Long-Term Scientific Internship Program for Ukrainian Scientists / Visiting Researcher | Jul 2026-Aug 2024

Institute of High-Pressure Physics, Polish Academy of Sciences (UNIPRESS), Warsaw, Poland

Structural analysis of $\text{Cu}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$ nanoferrites using Rietveld refinement; cation-distribution and secondary-phase analysis; optical band-gap evaluation; and DFT+U calculations in Quantum ESPRESSO.

Visiting Researcher - National Scholarship Programme of the Slovak Republic | Feb-Nov 2025

Department of Magnetism, Institute of Experimental Physics, Slovak Academy of Sciences, Kosice, Slovakia

Project: Polymer-Based Ferrite Nanocomposites with Core-Shell Structure for Advanced Water Pollution Treatment.

Ulam NAWA Fellow / Visiting Researcher | Jan 2023-Dec 2024

AGH University of Krakow, Krakow, Poland

Project: Nanosized Spinel Ferrites and Spinel Composite Photocatalysts as Promising Materials for Water Purification. Polish National Agency for Academic Exchange (NAWA), Stanislaw Ulam Programme.

PREVIOUS ACADEMIC POSITIONS

Associate Professor | 2022-2025

Department of Medical Informatics, Medical and Biological Physics, Ivano-Frankivsk National Medical University, Ukraine

Assistant Professor | 2018-2022

Department of Medical Informatics, Medical and Biological Physics, Ivano-Frankivsk National Medical University, Ukraine

EDUCATION

Ph.D. in Physics and Chemistry of Surfaces | 2014-2018

Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine

Dissertation: Synthesis, Structure and Physicochemical Properties of Nanodispersed Magnesium-Substituted Lithium Ferrites.

M.Sc. in Physics, Diploma with Honors | 2013-2014

Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine

Thesis: Effect of Magnesium Substitution on Physical Properties of Lithium-Iron Spinel.

B.S. in Physics | 2009-2013

Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine

SELECTED RESEARCH PROJECTS

Microwave Properties of Nanocomposites Based on Substituted Hexaferrites in the High-Frequency Range of Electromagnetic Radiation (2024-2026) *Ministry of Education and Science of Ukraine, Project No. 0124U001654*

RESEARCH EXPERTISE

- Synthesis and compositional engineering of spinel ferrite nanoparticles, including Cu-, Ni-, Co-, Mg-, and rare-earth-substituted systems.
- Sol-gel and polymer-assisted auto-combustion approaches for nanoscale ferrite synthesis.
- Structure-property analysis of magnetic, dielectric, optical, thermal, magnetocaloric, photocatalytic, and electromagnetic-shielding behavior.
- Photocatalytic and photo-Fenton degradation of organic pollutants and development of magnetically recoverable catalysts.
- Current expansion into MXene synthesis, stabilization, ferrite/MXene interface engineering, and environmental applications.
- Scientific writing, project development, international collaboration, student supervision, and conference presentation.

SELECTED PUBLICATIONS

Selected recent publications; full list available through Scopus Author ID 57210568330.

1. Mazurenko J., Kaykan L., Zywczyak A., Marzec M.M., Turovska L., Hreus K. Magnesium-substituted copper ferrites for sustainable wastewater treatment via visible-light photocatalysis. *Journal of Sol-Gel Science and Technology* 118(1), Article 35 (2026). DOI: 10.1007/s10971-026-07151-x
2. Yakovenko O.S., Matzui L.Yu., Vovchenko L.L., Kaykan L., Zaiats D.O., Dubyk K.V., Perets Y.S., Mazurenko J. Electrophysical Properties of Magnetic Composites with Ferrites and Nanocarbon. *IEEE Transactions on Magnetics* 62(8), 2800106 (2026). DOI: 10.1109/TMAG.2026.3705203
3. Mazurenko J., Kaykan L., Sijo A.K., et al. Photocatalytic efficiency of nickel-doped copper ferrite in organic dye decomposition. *Nano-Structures & Nano-Objects* 45, 101603 (2026). DOI: 10.1016/j.nanoso.2025.101603
4. Mazurenko J., Kaykan L., Mokliak V., Marzec M.M., Matzui L., Vovchenko L., Yakovenko O. Study of charge transfer mechanisms in cobalt-substituted copper ferrites. *Journal of Materials Science: Materials in Electronics* 36(33), 2092 (2025). DOI: 10.1007/s10854-025-16193-w
5. Mazurenko J., Sijo A.K., Kaykan L., Kotsyubynsky V., Gondek L., Zywczyak A., Marzec M., Vyshnevskiy O. Synthesis and Characterization of Copper Ferrite Nanoparticles for Efficient Photocatalytic Degradation of Organic Dyes. *Journal of Nanotechnology* 2025, 8899491 (2025). DOI: 10.1155/jnt/8899491
6. Mazurenko J., Szostak E., Gondek L., Kaykan L., Zywczyak A., Vyshnevskiy O. Structural and magnetic studies of cobalt-substituted copper ferrites for efficient photocatalytic dye degradation. *Inorganic Chemistry Communications* 171, 113648 (2025). DOI: 10.1016/j.inoche.2024.113648

SELECTED BOOK CHAPTER AND INDEXED CONFERENCE PROCEEDINGS

Yakovenko O., Vovchenko L., Kaykan L., Mazurenko J., Len T., Dubyk K., Shpylka D., Matzui L. Shielding Properties of Epoxy Composites Enhanced with Nanosized Ferrite Fillers. In *Springer Proceedings in Physics*, pp. 201-211 (2026). DOI: 10.1007/978-3-031-99013-7_12

Matzui L., Vovchenko L., Len T., Dubyk K., Shpylka D., Yakovenko O., Kaykan L., Mazurenko J. Electromagnetic Shielding Performance of Spinel Ferrite-Epoxy Nanocomposites. 2026 *IEEE 43rd International Conference on Electronics and Nanotechnology (ELNANO)*, pp. 46-49 (2026). DOI: 10.1109/ELNANO63396.2026.11601464

PATENTS

1. Utility Model Patent No. 149889 (2021). Method for producing ferrite materials with a spinel structure and nanoscale crystallites. Co-author. Energy-efficient sol-gel auto-combustion route for nanostructured ferrites with magnetic and biomedical applications.
2. Ukrainian Utility Model Patent No. 163225 (published June 3, 2026). Method for producing a nanosized copper ferrite-based photocatalyst for purification of water from organic dyes. Application No. u 2025 06397.
3. Ukrainian Utility Model Patent No. 163671 (published July 15, 2026). Method for synthesis of magnetic nanosized spinel MeFe_2O_4 , where Me = Cu, Mg, Ni, Co. Application No. u 2026 00625.

HONORS AND AWARDS

- Fulbright Visiting Scholar Program, United States (2026).
- Virtual Ukraine Institute for Advanced Study (VUIAS) Fellow, 2026–2027.
- Scholarship of the President of Ukraine for Young Scientists (2025-2027).
- National Scholarship Programme of the Slovak Republic (2025).

- Ulam NAWA Programme, Polish National Agency for Academic Exchange (2023-2024).
- Scholarship of the Cabinet of Ministers of Ukraine for Young Scientists (2022).
- Young Scientist of the Year, Council of Young Scientists under the Ministry of Education and Science of Ukraine (2021).

SELECTED CONFERENCE PRESENTATIONS

IEEE NAP 2025, Bratislava, Slovakia - Influence of Rare Earth Substitution on the Photocatalytic Efficiency of Spinel Ferrite Nanoparticles.

CSMAG 2025, Kosice, Slovakia - Electrophysical Properties of Magnetic Composites with Ferrites and Nanocarbon.

IVEC 2025, Rotterdam, The Netherlands - Spinel Ferrite-Epoxy Nanocomposites for Efficient Electromagnetic Interference Shielding.

PROFESSIONAL MEMBERSHIP AND SERVICE

Member, European Ceramic Society (ECerS), Membership No. EUR 26002.

Member, Ukrainian Materials Research Society (UMRS), Registration No. UMRS-2026-042.

Peer reviewer for 10+ manuscripts in 2026, including Ceramics International, Materials Research Bulletin, Journal of Solid State Chemistry, Applied Physics A: Materials Science & Processing, Micro and Nanostructures, and Next Materials.

Mentoring and supervision of undergraduate research projects and student scientific activities.

LANGUAGES

Ukrainian - Native | English - C1 (Advanced) | Polish – B1 (Intermediate)