



Daria Kondrakhova

Residence permit: 865530/9179 **Nationality:** Ukrainian **Date of birth:** 30/05/1986

Place of birth: Sumy, Ukraine **Gender:** Female

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Home: Boženy Němcovej 14, 04001 Kosice (Slovakia)

Work: Watsonova 1935/47, 04001 Kosice (Slovakia)

ABOUT ME

Researcher in thin-film physics and materials characterization (AFM, SEM/EDX, XRD); preparation of functional thin films and coatings (magnetron sputtering); investigation of magnetotransport properties in multilayer systems. Co-author of an innovative methodology for tear fluid analysis for the diagnosis of inflammatory and neurodegenerative diseases.

WORK EXPERIENCE

Slovak Academy of Sciences, Institute of Materials Research – Košice, Slovakia

City: Košice | Country: Slovakia

Research associate

[01/06/2025 – Current]

- Microstructural characterization using SEM at the micro- and nanoscale; determination of fundamental mechanical properties (hardness, fracture toughness, flexural strength, Young's modulus); evaluation of basic tribological characteristics; participation in national and international conferences.
- Dual-phase boride–carbide multicomponent coatings based on transition metals, prepared by High Target Utilization Sputtering (HiTUS).

Department of Applied Physics, Sumy State University – Sumy , Ukraine

City: Sumy | Country: Ukraine

Research associate

[01/11/2013 – 06/07/2019]

- Preparation of thin films and multilayer systems by thermal evaporation and vacuum sputtering; study of their magnetic properties using VSM and SQUID magnetometry.
- Structural and phase analysis of multilayers, including coercivity and magnetic flux density as functions of layer thickness and deposition conditions; annealing of samples and monitoring of magnetic properties.
- Planning and execution of experiments: systematic sample handling, data acquisition and interpretation, control of experimental conditions, preparation of scientific reports, and use of specialized software for data analysis and visualization.
- Microscopic and elemental analysis (SEM, EDX, AFM) to investigate microstructure and composition.
- Participation in national and international conferences.

Johannes Gutenberg University Mainz (Germany) – Mainz, Germany

City: Mainz | Country: Germany

Individual grant from the Ministry of Education and Science of Ukraine - study stay at Johannes Gutenberg University Mainz (Germany)

[16/02/2012 – 17/06/2012]

- The aim of my training was to investigate the correlation between elemental composition and the magnetic properties of thin-film materials using modern analytical instrumentation.
- The methodological part of the work focused on studying the crystalline structure and magnetoresistive properties of multilayer thin-film materials based on Fe, Cu, Co, and Cr intended as sensitive elements in micro-devices, and on mastering modern techniques for analysing thin-film properties using the magneto-optical Kerr effect (MOKE).

 **Faculty of Electronics and Information Technologies, Sumy State University** – Sumy, Ukraine

City: Sumy | Country: Ukraine

Engineer, Department of Applied Physics

[01/08/2008 – 29/10/2010]

- Phase composition, electrical and magnetoresistive properties of thin-film materials with spin-dependent electron scattering
- Preparation and conditioning of samples for TEM, SEM, and MOKE analyses
- Processing and evaluation of measurements using specialized software
- Participation in national and international conferences
- Participation in professional seminars in materials engineering

 **Faculty of Electronics and Information Technologies, Sumy State University** – Sumy , Ukraine

City: Sumy | Country: Ukraine

Engineer, Department of Applied Physics

[21/04/2008 – 30/06/2008]

- Conducted research tasks focused on the phase composition of thin films
- Developed professional technical skills in solid-state physics

 **Unix-Business (private company)** – Sumy , Ukraine

City: Sumy | Country: Ukraine

Administrative Secretary

[01/07/2003 – 31/08/2003]

- Organized and logged incoming/outgoing correspondence
- Checked documentation prior to archiving or digitization
- Retrieved, sorted, and filed documents per internal standards
- Coordinated with departments to obtain missing data and documents

EDUCATION AND TRAINING

PhD in Physics (study programme: Advanced Materials) Dissertation: "Novel diagnostic methods based on atomic force microscopy"

Pavol Jozef Šafárik University in Košice, Faculty of Science [01/09/2018 – 15/04/2025]

City: Košice | Country: Slovakia

PhD in Physics. Dissertation: "Relationship between the structure and properties of sensitive thin-film sensing elements of magnetic-field sensors."

Sumy State University [2010 – 2013]

City: Sumy | Country: Ukraine | Website: <https://essuir.sumdu.edu.ua/handle/123456789/39605>

Master's degree in Electronic Devices and Systems

Sumy State University, Faculty of Electronics and Information Technologies [01/09/2007 – 30/06/2008]

City: Sumy | Country: Ukraine | Website: <https://int.sumdu.edu.ua/en/>

Bachelor's degree in Electronic Devices and Systems

Sumy State University, Faculty of Electronics and Information Technologies [01/09/2003 – 30/06/2007]

City: Sumy | Country: Ukraine | Website: <https://int.sumdu.edu.ua/en/>

LANGUAGE SKILLS

Mother tongue(s): Ukrainian | Russian

Other language(s):

English

LISTENING B1 READING B1 WRITING B1

SPOKEN PRODUCTION B1 SPOKEN INTERACTION B1

Slovak

LISTENING C1 READING C1 WRITING B1

SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Analysis of the structure of the prepared samples using atomic force microscopy / Nanofabrication of prototypes of functional elements for spintronic devices using e-beam lithogr / Príprava tenkých vrstiev metodikami naparovania a naprašovania. / Rastrovacia elektrónová mikroskopia a EDX, rastrovacie sondové mikroskopie (AFM, STM). / Meranie a analýza magnetických vlastností materiálov / Operácie a procedúry v čistých priestoroch, nanášanie resistov pomocou spin coating / Determination of composition using EDX analysis / Preparation of thin films using magnetron sputtering and electrodeposition / Microsoft Word / Microsoft Excel / Microsoft PowerPoint / Microsoft Office / Microsoft Outlook / OriginLab / Photoshop / Preparation of metallic and non-metallic magnetic nanoparticles

PUBLICATIONS

According to Scopus as of 24 Sep 2024: 10 publications, 71 citations, h-index 6.

[2025]

Determination of diabetes mellitus disease markers in tear fluid by photothermal AFM-IR analysis.

Authors: Kondrakhova, D., Unger, M., Stadler, H., Zakutanská, K., Tomašovičová, N., Tomečková, V., Horák J., Kimakova, T., Komanicky, V. | **Journal Name:** Nanomedicine: Nanotechnology, Biology, and Medicine | **Volume, Issue and Pages:** 64 (2025): 102803

[2024]

The effect of gold and platinum thin island-like films on gas-sensing properties of tin dioxide-based sensors.
(submitted)

Authors: Kondrakhova, D., Bilanych, V., Bilanchuk, M., Kormosh, V., Pogodin, A., Vorobiov, S., Kimakova, T., Komanicky, V. | **Journal Name:** Molecular Crystalsand Liquid Crystals

[2024]

Effect of insulator matrix on electrical transport properties of iron-insulator discontinuous multilayers

Authors: Pazukha, I., Shkurdoda, Y., Tyschenko, K., Lohvynov, A., Pylypenko, O., Lisnichuk, M., Kondrakhova, D., Latyshev, V., Vorobiov, S., & Komanicky, V. | **Journal Name:** Vacuum | **Volume, Issue and Pages:** 230 (2024): 113650

[2023]

Experimental analysis of tear fluid and its processing for the diagnosis of multiple sclerosis.

Authors: Tomečková, V., Tkáčiková, S., Talian, I., Kondrakhova, D., Zakutanská, K., Fabriciová, G., Hovan, A., Skirková, M., Komanický, V., Tomašovičová, N. | **Journal Name:** Sensors | **Volume, Issue and Pages:** 23.11 (2023): 5251

[2023]

Sensors based on Tin and Indium oxides for the determination of acetone in human breath.

Authors: Kimakova, T., Kondrakhova, D., Ovodok, E., Ivanovskaya, M., Kormosh, V., Vorobiov, S., Lisnichuk, M., Bilanych, V., Komanicky, V. | **Journal Name:** ACS Omega | **Volume, Issue and Pages:** vol. 8, issue 43 (2023)

[2023]

The effects of fisetin on cyclosporine-treated dry eye disease in dogs.

Authors: Krajčíková, K., Balicka, A., Lapšanská, M., Trbolová, A., Guľašová, Z., Kondrakhova, D., Komanický, V., Rašiová, A., & Tomečková, V. | **Journal Name:** International Journal of Molecular Sciences | **Volume, Issue and Pages:** vol. 24, issue 2 (2023): 1488

[2021]

Tear fluid biomarkers in major depressive disorder: potential of spectral methods in biomarker discovery.

Authors: Krajčíková, K., Semančíková, E., Zakutanská, K., Kondrakhova, D., Mašlanková, J., Stupák, M., et al. | **Journal Name:** Journal of Psychiatric Research | **Volume, Issue and Pages:** 138 (2021): 75–82

[2021]

Temperature stability of crystalline structure, electro- and magnetotransport properties of functional nanostructures of spin-valve type Ni/Dy/Co

Authors: Lohvynov, A., Kondrakhova, D., Shpetnyi, I., Cheshko, I., Vorobiov, S., Chornous, A. | **Journal Name:** Metallofizika i Noveishie Tekhnologii | **Volume, Issue and Pages:** vol. 43, issue 2 (2021): 143-157

[2020]

Correlation between the structural state and magnetoresistive properties of granular CoxAg100-x alloy thin films

Authors: Shpetnyi, I. O., Vorobiov, S. I., Kondrakhova, D. M., Shevchenko, M., Duplik, L., Panina, L., Grebinaha, V., Gorobets, Y. I., Satrapinsky, L., & Luciński, T. | **Journal Name:** Vacuum | **Volume, Issue and Pages:** 176 (2020): 109329

[2019]

Noninvasive diagnostic methods for diabetes mellitus from tear fluid.

Authors: Glinská, G., Krajčíková, K., Zakutanská, K., Shylenko, O., Kondrakhova, D., Tomašovičová, N., et al. | **Journal Name:** RSC Advances | **Volume, Issue and Pages:** vol. 9, issue 31: 18050–18059.

[2019]

The structural-phase state and magnetoresistive properties of thin film alloys obtained by co-evaporated Cu and Co

Authors: Shpetnyi, I., Kondrakhova, D., Vorobiov, S., Scheibe, B., Grabinaha, V., Derecha, D., Gorobets, Y., Protsenko, I. | **Journal Name:** Journal of Magnetism and Magnetic Materials | **Volume, Issue and Pages:** 474 (2019): 624-631.

DRIVING LICENCE

Driving Licence: AM

Driving Licence: B1

Driving Licence: B

PROJECTS

[2018 – 2025]

Team member of research projects funded by APVV, VEGA, and NATO.

VEGA 1/0204/18, APVV-17-0059, APVV-18-0358, APVV VBLT SK-BY-RD-19-0008, VEGA 1/0333/20, APVV-20-0324 (nanoMAG), APVV-20-0528, APVV-23-0049 (Hcatal), NATO SPS G6131

HONOURS AND AWARDS

International Conference on Nanomaterials: Applications & Properties

Best Poster Award — 9th International Conference on Nanomaterials: Applications & Properties, Odesa, Ukraine (2019).

Sem napíšte opis...

[10/12/2015] Sumy State University

Authorship of a utility model: “Sensitive element of a thin-film magnetic-field sensor,” No. U 2015 09908

The magnetic-field sensor element has the shape of a parallelepiped made of a metallic material, formed by a multilayer foil deposited on an insulating substrate. The multilayer foil comprises at least three alternately arranged layers consisting of magnetic (Fe or Co) and non-magnetic metallic materials (O, Cu, Pd or Pt).

SPECIALIZATION

Scientific Specialization

- Physics of thin films and protective coatings; evaporation and sputtering (PVD; magnetron sputtering) and optimization of deposition processes
- Materials characterization: scanning electron microscopy (SEM/EDX); scanning probe microscopies (AFM, STM); transmission electron microscopy (TEM)
- Measurement and analysis of magnetic properties of materials
- Micro-/nanostructure, surface morphology and roughness (Ra/Sa); structure–property relationships
- Cleanroom operations: resist coating (spin coating), resist processing and development, etching (RIE)
- Magnetotransport in multilayer systems (GMR); MOKE characterization
- Analysis of dried microdroplets of tear fluid; identification of biomarkers for ophthalmological diagnostics
- Electroanalytical methods: cyclic voltammetry

OTHER SKILLS

Other personal skills

Teamwork; flexibility; responsibility; attention to detail; strong communication; motivation to work and learn new things; fast learner.