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| **Curriculum Vitae**  Iryna Sharai  Research Scientist, PhD in Physics |  |

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| **Personal Data and Contacts**  Birth date 1978, December 2  Nationality Ukrainian  Family Married, 2 child  Address Vernadskogo 36-b, Kyiv,  03142, Ukraine  E-mail [sharayirina@gmail.com](mailto:sharayirina@gmail.com) | Google Scholar: ?hl=uk&user=\_sNo\_pkAAAAJ  Web of Science: AAK-1662-2020  ORCID: 0000-0001-9472-965X  SCOPUS: 56094713400 |

**Background and objectives**

My ﬁeld of expertise is magnetism of nanostructures. Currently my research is focused on designing magnetic nanostructures with new functionalities. Some of my recent results are the study of influence of structural inhomogeneities on the surface of the magnetic films on their magnetic and optical properties. The investigations of ultra-thin magnetic films layers of bismuth-substituted ferrite garnets and one-dimensional magnetophotonic crystals were performed. It was found that a high-energy ion treatment of substrates surface leads to the formation of a transitional layer on the boundary between substrate and film with a smooth change of composition that enables to control the magnitude of magneto-optical effects in such films. This changes the compensation point of the magnetic sample, as well as magnitude and sign of magneto-optical effect. It was experimentally demonstrated that the effectiveness of recrystallization and the roughness of NiFe films surface when irradiated by nanosecond laser pulses depends on the laser radiation wavelength. For the first time, the method of managing of high-frequency magnetic susceptibility of magnetic nanoparticles by using an external constant magnetic field for their heating by an alternating magnetic field was developed. It was shown that varying the magnitude and direction of the constant magnetic field, we can change the values of high-frequency magnetic susceptibility by dozen times. The phenomenon of nonlinear dependence of magnetic permeability on the magnetic field was proposed to use for the creation of high-sensitive compact flux-gate magnetic field sensors with parametric amplification of signals. The methods of creation of high-gradient magnetic fields with a given configuration using structured substrates were proposed.

**Education**

* 1996–2002 bachelor and specialist student, National Technical University of Ukraine "Kyiv Politechnic Institute" (www.kpi.ua), The Faculty of Physics and Mathematics, Kyiv, Ukraine.

Specialization: Physics.

Specialist thesis title: Hydrolized silicon oxide thin films optical studies.

* 2009–2012 PhD in Physics, Institute of Magnetism, NAS of Ukraine and MES of Ukraine, Kyiv.

PhD thesis title: Influence of structural inhomogeneities on the surface of the magnetic films on their magnetic and optical properties.

**Professional Experience**

Institute of Magnetism, NAS of Ukraine and MES of Ukraine:

Senior Research Scientist (2017-present), Research Scientist (2016-2017), Junior researcher (2012-2016).

**Awards**

2011 Diploma for the best poster report among young scientists at the International conference

"ICFM-2013" (Partenit, Crimea).

2009–2010 Fellowship of Presidium NAS of Ukraine for young scientists.

**Primary Scientific and Technical Interests**

study of nanostructures and nanomaterials; analysis of physical models and experimental studies of characteristics and properties of nanostructures; study of the influence of structural inhomogeneities on magnetic, magneto-optical and electrical characteristics of thin films and fine-dispersed materials.

**Skills and Techniques**

Morphological characterization: atomic (magnetic) force microscopy; Magnetic characterization: magneto-optical Kerr-eﬀect, measurements of magnetic susceptibility by resonance methods.

**Participation in International projects**

2013–2014 Development and optimization of technology for obtaining magneto rigid and magnet soft materials for magnetoplast (STCU).

**Publications and Conferences**

20 published papers, 3 invention patent, 40 conference presentations.

**Selected papers:**

* Shaposhnikov A.N. Modiﬁcation of Bi:YIG ﬁlm properties by substrate surface ion pre-treatment / A.N.Shaposhnikov, A.R. Prokopov, A.V. Karavainikov, V.N. Berzhansky, T.V. Mikhailova, V.A. Kotov, D.E. Balabanov, I.V. Sharay, O.Y. Salyuk, M. Vasiliev, V.O. Golub // Materials Research Bulletin. – 2014. – vol.55. – P. 19–25.
* Shaposhnikov A.N. Surface Properties of Nanoscale Iron Garnet Films / T.B. Kosykh, A.S. Prosyakov, A.P. Pyatakov, A.N. Shaposhnikov, A.R. Prokopov, I.V. Sharay // Solid State Phenomena. – 2015. – Vols. 233-234. – P. 678-681.
* M.M. Krupa. Magnetic field sensors based on the foil of amorphous cobalt alloy and NiMnGa martensite single-crystals / Yu.B. Skirta, I.V. Gerasimchuk, I.V. Sharay // Sensors and ActuatorsA: Physical. – 2017.–V.264.– P.165-171.
* Ignatyeva T.A. Perspectives of constant gradient magnetic fields applications in biotechnology / T.A.Ignatyeva, V.N. Voyevodin, A.N. Goltsev, V.V. Kiroshka, A.M. Bovda, V.V. Kalynovskii, A.N. Velikodny, P.A. Kutsenko, V.О. Golub, Yu.І. Dzhedzheria, I.V. Sharai // American Journal of Bioscience and Bioengineering. – 2014. – vol.2. – №6. – P. 72-77.
* Detection of biogenic magnetic nanoparticles in ethmoid bones of migratory and non-migratory fishes / Svitlana Gorobets, Oksana Gorobets, Maryna Bulaievska, Iryna Sharay // SN Applied Sciences.–(2019).-1.-63.
* V. Golub, I.R. Aseguinolaz, O. Salyuk, D. Popadiuk, I. Sharay, R. Fernández, V. Alexandrakis, S.A. Bunyaev, G.N. Kakazei, J.M. Barandiarán, V.A. Chernenko, Thickness dependences of structural and magnetic properties of Ni(Co)MnSn/MgO(001) thin films // Journal of Alloys and Compounds. – 2021. –V. 862. – 158474.
* I.O. Shpetnyi, V.Ya. Pak, Yu.O. Shkurdoda, S.I. Vorobiov,b, D.O. Derecha, A. V. Hruzevych,d,
* I.V. Sharai, A.F. Kravets, Yu.I. Gorobets, L. Satrapinskyy, T. Luci nski. Influence of the magnetic field on the structural characteristics of granular CoxAg100-x thin film alloys // Thin Solid Films. – 2021. – V. 724. –138613.
* O.I. Nakonechna, Gurmeet Singh Lotey, Ankush Kumar Tangra, Sarbjit Singh, A., V. Bodnaruk,
* V.O. Zamorskyi, N.N. Belyavina, I.V. Sharay, A.I. Tovstolytkin, Aging effects in NaFeO2 nanoparticles: Evolution of crystal structure and magnetic properties // Journal of Magnetism and Magnetic Materials. – 2021. –V.540. – 168452.
* Svitlana Gorobets , Oksana Gorobets , Iryna Sharai, Tatyana Polyakova, Vitalii Zablotskii. Gradient Magnetic Field Accelerates Division of E. Coli Nissle 1917. Cells 2023, 12, 315.
* Svitlana Gorobets, Oksana Gorobets, Iryna Sharai, Tatyana Polyakova, Vitalii Zablotskii. Interaction of magnetic fields with biogenic magnetic nanoparticles on cell membranes: physiological consequences for organisms in health and disease. Bioelectrochemistry. Available online 1 February 2023, 108390.
* 16. Yurii Gorobets, Svitlana Gorobets, Oksana Gorobets, Alyona Magerman, Irina Sharai. Biogenic and anthropogenic magnetic nanoparticles in the phloem sieve tubes of plants. Journal of microbiology, biotechnology and food sciences. Journal of Microbiology, Biotechnology and Food Sciences, e5484. – 2023.https://doi.org/10.55251/jmbfs.5484 (Q3).

Sharai Iryna November, 30, 2023