

## CURRICULUM VITAE

<b>Full Name</b>	<b>Igor Gerasimchuk</b>
Citizenship	Ukraine
<b>Scientific Degrees and Academic Titles</b>	<p><b>Doctor of Sciences in Physics and Mathematics</b> (in Theoretical Physics) (2017), Institute of Magnetism, National Academy of Sciences of Ukraine and Ministry of Education and Science of Ukraine, Kyiv, Ukraine <i>D.Sc. Thesis: “Nonlinear localized states in structured media”.</i></p> <p>Academic Title: <b>Senior Research Scientist</b> in Theoretical Physics (2012).</p> <p><b>Ph.D. in Physics and Mathematics</b> (in Theoretical Physics) (2001), B.Verkin Institute for Low Temperature Physics and Engineering, National Academy of Sciences of Ukraine, Kharkiv, Ukraine <i>Ph.D. Thesis: “Localization of nonlinear waves in defect, layered and modulated systems”.</i></p>
<b>Education</b>	<p><b>Specialist</b> in Theoretical Nuclear Physics (First Class Honours Degree) (1997) – <b>M.Sc.</b> in Theoretical Nuclear Physics (First Class Honours Degree) equivalent, Department of Theoretical Physics, Faculty of Physics and Technology, Kharkiv State University, Kharkiv, Ukraine</p>
<b>Current Position</b>	<p><b>Leading Research Scientist</b> Institute of Magnetism, National Academy of Sciences of Ukraine and Ministry of Education and Science of Ukraine Vernadsky Blvd. 36b, 03142 Kyiv, Ukraine</p>
<b>Awards, Grants, Projects</b>	<p>2022-2023 – <b>Award of IEEE Magnetics Society “Magnetism for Ukraine 2022”</b> within the project “<i>Excitation of nonlinear exchange-dominated spin waves in nanoscale magnonic waveguides</i>”.</p> <p>2018 – <b>Grant of the President of Ukraine to Doctors of Sciences</b>, title “<i>Analytical models of skyrmions in antiferromagnets with the Dzyaloshinskii–Moriya interaction</i>”.</p> <p>2022-2023 – <b>Responsible Executor</b> of the Project 0122U002233 “<i>Development and study of materials with specified thermo- and magnetoelastic properties based on multicomponent magnetoactive elastomers</i>”, funded by Ministry of Education and Science of Ukraine.</p> <p>2018-2020 – <b>Responsible Executor</b> of the Project 0118U004007 “<i>Spin dynamics in magneto-ordered materials with metasurfaces</i>”, funded by Ministry of Education and Science of Ukraine.</p> <p>1995-1996 – <b>Winner</b> of Soros Foundation International Competition in International Soros Science Education Program (ISSEP), Personal Grant No.GSU052252.</p> <p>1995 – <b>Winner</b> of National All-Ukrainian Students Olympiad in Physics.</p>
<b>International Collaboration</b>	<p>2006 – <b>Visiting Scientist</b> in Leibniz-Institute of Polymer Research Dresden, Dresden, Germany.</p> <p>2003-2005 – <b>Post-Doctoral Research Fellow</b> in Institute of Materials Science of Madrid, CSIC, Madrid, Spain.</p>

<b>Expertise</b>	<ul style="list-style-type: none"> <li>✓ <b>Member of the Expert Council of the Ministry of Education and Science of Ukraine</b> on issues of attestation of scientific personnel in Physical and Mathematical Sciences (2022–present).</li> <li>✓ <b>Member of the Section of the Scientific Council of the Ministry of Education and Science of Ukraine</b> in the speciality General Physics (2019–2022).</li> <li>✓ <b>Member of the Specialized Scientific Council Д 26.248.01 at the Institute of Magnetism</b>, NAS of Ukraine and MES of Ukraine, in the speciality Theoretical Physics.</li> <li>✓ <b>Member of the One-Time Specialized Scientific Council ДФ 26.248.03 at the Institute of Magnetism</b>, NAS of Ukraine and MES of Ukraine, in the speciality Theoretical Physics.</li> <li>✓ <b>Member of the One-Time Specialized Scientific Council ДФ 26.001.251 at the Taras Shevchenko National University of Kyiv</b>, in the speciality Theoretical Physics.</li> <li>✓ <b>Member of the IEEE Magnetics Society</b> (<a href="https://www.ieee.org">https://www.ieee.org</a>, <a href="https://ieeemagnetics.org">https://ieeemagnetics.org</a>).</li> <li>✓ <b>Member of the Academic Council of the Institute of Magnetism</b>, NAS of Ukraine and MES of Ukraine.</li> <li>✓ <b>Reviewer</b> of scientific journals <i>J. Appl. Phys.</i>, <i>Solid State Commun.</i>, <i>Eur. Phys. J. D</i>, <i>Eur. Phys. J. B</i>, <i>Mod. Phys. Lett. B</i>.</li> </ul>
<b>Disciplines taught</b>	<i>Quantum Mechanics, Solid State Physics, Nuclear Physics, Dynamics and Analytical Mechanics, Theoretical Mechanics, General Physics, Methods of Mathematical Physics, Differential and Integral Equations, Qualitative Theory of Differential Equations, Higher Mathematics, Application Packages for Molecular Biology Problems, Selected Sections of Solid State Physics, Selected Sections of Computer Analysis.</i>
Scopus	<a href="https://www.scopus.com/authid/detail.uri?authorId=9245223300">https://www.scopus.com/authid/detail.uri?authorId=9245223300</a>
Web of Science	<a href="https://www.webofscience.com/wos/author/record/8392">https://www.webofscience.com/wos/author/record/8392</a>
ORCID	<a href="https://orcid.org/0000-0002-2208-7050">https://orcid.org/0000-0002-2208-7050</a>
Google Academy	<a href="https://scholar.google.com.ua/citations?user=fiUtkiIAAAAJ">https://scholar.google.com.ua/citations?user=fiUtkiIAAAAJ</a>
<b>Contacts</b>	Institute of Magnetism, NAS of Ukraine and MES of Ukraine Vernadsky Blvd. 36b, 03142 Kyiv, Ukraine Phone: +380 44 424 1020 E-mail: igor.gera at gmail.com

### **Professional Experience**

- 2019–pres. **Leading Research Scientist**, Institute of Magnetism, NAS of Ukraine and MES of Ukraine (Kyiv, Ukraine).
- 2023–pres. **Professor** (part-time work), Institute of Physics and Technology, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” (Kyiv, Ukraine).
- 2020–2023 **Professor** (part-time work), Faculty of Physics and Mathematics, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” (Kyiv, Ukraine).
- 2008–2019 **Senior Research Scientist**, Institute of Magnetism, NAS of Ukraine and MES of Ukraine (Kyiv, Ukraine).
- 2011–2020 **Associate Professor** (part-time work), Faculty of Physics and Mathematics, National

- Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” (Kyiv, Ukraine).
- 2008–2011 **Doctoral Candidate**, Institute of Magnetism, NAS of Ukraine and MES of Ukraine (Kyiv, Ukraine).
- 2008–2011 **Associate Professor** (part-time work), Department of Applied Physics, National Aviation University (Kyiv, Ukraine).
- 2007–2008 **Head of the Laboratory**, Faculty of Biotechnology and Bioengineering, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” (Kyiv, Ukraine).
- 2007–2008 **Senior Research Scientist** (part-time work), Faculty of Biotechnology and Bioengineering, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” (Kyiv, Ukraine).
- 2006–2006 **Visiting Scientist** (part-time work), Leibniz-Institute of Polymer Research Dresden (Dresden, Germany).
- 2003–2005 **Post-Doctoral Research Fellow** (part-time work), Institute of Materials Science of Madrid, CSIC (Madrid, Spain).
- 2001–2007 **Research Scientist**, Institute for Theoretical Physics, National Science Center “Kharkov Institute of Physics and Technology” (Kharkiv, Ukraine).
- 2001–2001 **Junior Research Scientist**, Institute for Theoretical Physics, National Science Center “Kharkov Institute of Physics and Technology” (Kharkiv, Ukraine).
- 2000–2001 **Junior Research Scientist**, B.Verkin Institute for Low Temperature Physics and Engineering, NAS of Ukraine (Kharkiv, Ukraine).
- 1997–2000 **Ph.D. Student**, Department of Theoretical Physics, Faculty of Physics and Technology, V.N. Karazin Kharkiv National University (Kharkiv, Ukraine).
- 1991–1997 **Student**, Faculty of Physics and Technology, Kharkiv State University (Kharkiv, Ukraine).

### Research Interests

- ✓ Theoretical and numerical study of non-uniform magnetic spin textures in antiferromagnets.
- ✓ Dynamics and character of localization of nonlinear spin waves in inhomogeneous nonlinear media with magnetic ordering, in magnetic multilayers with metasurfaces.
- ✓ Character of adsorption of real polymer chains in systems of permeable interfaces and hard surfaces.
- ✓ Analytical and numerical investigations of localized states of nonlinear waves (solitons) propagating in structured nonlinear media of different physical nature along the system of connected metasurfaces, and their stability.
- ✓ Localized states of nonlinear waves in the periodic system of combined linear–nonlinear defect layers and the nature of spatial localization (superlocalization) of nonlinear waves in anharmonic periodic structured media.
- ✓ Analytical and numerical analysis of the vortex dynamics of liquids near the magnetized ferromagnetic surface under electrochemical etching and influence of an external magnetic field.
- ✓ Character and peculiarities of nonlinear dynamics of incommensurate structures, homogeneous systems with the periodically modulated in space ground state (“self-modulated” systems).

## Publications

147 scientific publications in total, including:

### Books

- 1) V.S. Gerasimchuk, T.L. Rebenchuk, **I.V. Gerasimchuk**, *The Method of the Inverse Scattering Problem and Its Applications*, 2nd edition, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, 2019, 110 p.
- 2) V.S. Gerasimchuk, T.L. Rebenchuk, **I.V. Gerasimchuk**, *The Method of the Inverse Scattering Problem and Its Applications*, Polytechnica Publishers, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, 2016, 96 p.

### Book Chapters

- 1) Alexander S. Kovalev and **Igor V. Gerasimchuk**, *Soliton Dynamics in Non-Commensurate Surface Structures*, In: EPIOPTICS-8, ed. by A. Cricenti, Series “*The Science and Culture Series – Physics*”, World Scientific, Singapore, 2006, Pp. 86–91.
- 2) **Igor V. Gerasimchuk** and Alexander S. Kovalev, “*Supersolitons*” in *Infinite Arrays of Plane-Parallel Layers or Coupled Identical Optical Waveguides*, In: EPIOPTICS-7, ed. by A. Cricenti, Series “*The Science and Culture Series – Physics*”, World Scientific, Singapore, 2004, Pp. 122–127.
- 3) **I.V. Gerasimchuk**, A.S. Kovalev, *Localization of Light Beam in Nonlinear Optical Waveguide Array*, In: EPIOPTICS 2000, ed. by A. Cricenti, Series “*The Science and Culture Series – Materials Science*”, World Scientific, Singapore, 2001, Pp. 139–144.

### Selected Papers in Scientific Journals

- 1) Victor S. Gerasimchuk, Yuri I. Gorobets, Oksana Yu. Gorobets & **Igor V. Gerasimchuk**, *Spatial antiferromagnetic spin texture as a nano-oscillator*, **Scientific Reports**, 2023, Vol. 13, Pp. 6613 (10 pp.). <https://doi.org/10.1038/s41598-023-33220-0> [WoS & Scopus, Quartile: Q1]
- 2) D. M. Samchenko, G. M. Kochetov, D. O. Derecha, Yu. B. Skirta, **I. V. Gerasimchuk**, A. V. Hruzevych, *Optical Studies of the Periodic Motion of an Electrolyte in a Magnetic Field*, **Metallofiz. Noveishie Tekhnol.**, 2023, Vol. 45, accepted for publication. [Scopus, Quartile: Q3]
- 3) Dmytro O. Derecha, Yury B. Skirta, **Igor V. Gerasimchuk**, Andrii V. Hruzevych, *Statistical and Fourier analysis of the vortex dynamics of fluids in an external magnetic field*, **Journal of Electroanalytical Chemistry**, 2020, Vol. 873, Pp. 114399 (7 pp.). <https://doi.org/10.1016/j.jelechem.2020.114399> [WoS & Scopus, Quartile: Q1]
- 4) Victor S. Gerasimchuk, Olha V. Konotopchyk, Ihor Yu. Loboda, **Igor V. Gerasimchuk**, *Exact Solution for Localized States of Nonlinear Waves in the Structured Anharmonic Media with Two Interfaces*, **IEEE Xplore**: Proceedings of the 2018 IEEE 8th International Conference Nanomaterials: Applications & Properties (NAP), 2019, Pp. 1–4. <https://doi.org/10.1109/NAP.2018.8915356> [WoS]
- 5) Yu.I. Gorobets, O.Yu. Gorobets, D.O. Derecha, Yu.B. Skirta, **I.V. Gerasimchuk**, V.V. Konovalova, A.A. Kyba, *Electrolyte–electrolyte phase separation under the influence of a DC magnetic field*, **Applied Nanoscience**, 2019, Vol. 9, Iss. 5, Pp. 859–863. <https://doi.org/10.1007/s13204-018-0827-4> [WoS & Scopus, Quartile: Q2]
- 6) **Igor V. Gerasimchuk** and Victor S. Gerasimchuk, *Localization of nonlinear spin waves in magnetic multilayers*, **Journal of Applied Physics**, 2018, Vol. 124, Iss. 8, Pp. 085301 (8 pp.).

<https://doi.org/10.1063/1.5037211> [WoS & Scopus, Quartile: Q2]

- 7) M.M. Krupa, Yu.B. Skirta, I.V. Sharay, **I.V. Gerasimchuk**, *Magnetic field sensors based on the foil of amorphous cobalt alloy and NiMnGa martensite single-crystals*, **Sensors and Actuators A: Physical**, 2017, Vol. 264, Pp. 165–171. <https://doi.org/10.1016/j.sna.2017.08.003> [WoS & Scopus, Quartile: Q1]
- 8) **I.V. Gerasimchuk**, Yu.I. Gorobets, V.S. Gerasimchuk, *Nonlinear Schrödinger Equation for Description of Small-amplitude Spin Waves in Multilayer Magnetic Materials*, **Journal of Nano- and Electronic Physics**, 2016, Vol. 8, No. 2, Pp. 02020 (7 pp.). [https://doi.org/10.21272/jnep.8\(2\).02020](https://doi.org/10.21272/jnep.8(2).02020) [Scopus, Quartile: Q3]
- 9) V.S. Gerasimchuk, **I.V. Gerasimchuk**, and N.I. Dranik, *Solutions of Nonlinear Schrödinger Equation with Two Potential Wells in Linear/Nonlinear Media*, **Journal of Mathematical Physics, Analysis, Geometry**, 2016, Vol. 12, No. 2, Pp. 168–176. <https://doi.org/10.15407/mag12.02.168> [WoS & Scopus, Quartile: Q4]
- 10) Dmytro O. Derecha, Yury B. Skirta and **Igor V. Gerasimchuk**, *Technique for Determining Fluids Motion Characteristics in the Vicinity of Ferromagnetic Solids Under Magneto-Chemical Treatment*, **Nanoscale Research Letters**, 2015, Vol. 10, Pp. 440-4. <https://doi.org/10.1186/s11671-015-1150-6> [WoS & Scopus, Quartile: Q2]
- 11) Dmytro O. Derecha, Yury B. Skirta, and **Igor V. Gerasimchuk**, *Electrolyte Vortex Dynamics in the Vicinity of a Ferromagnetic Surface in a Direct Current Magnetic Field*, **Journal of Physical Chemistry B**, 2014, Vol. 118, Pp. 14648–14651. <https://doi.org/10.1021/jp510275x> [WoS & Scopus, Quartile: Q1]
- 12) **I.V. Gerasimchuk**, V.S. Gerasimchuk, and J.U. Sommer, *Adsorption of Polymer Chains at Two Impenetrable Interfaces*, **JETP Letters**, 2011, Vol. 93, No. 8, Pp. 431–436. <https://doi.org/10.1134/S0021364011080078> [WoS & Scopus, Quartile: Q2]
- 13) **Igor V. Gerasimchuk** and Jens-Uwe Sommer, *Mean-Field Treatment of Polymer Chains Trapped between Surfaces and Penetrable Interfaces*, **Physical Review E**, 2007, Vol. 76, No. 4, Pp. 041803 (11 pp.). <https://doi.org/10.1103/PhysRevE.76.041803> [WoS & Scopus, Quartile: Q1]
- 14) **I.V. Gerasimchuk** and A.S. Kovalev, *Spatial Localization of Nonlinear Waves in Layered and Modulated Media*, **JETP Letters**, 2007, Vol. 85, No. 10, Pp. 488–492. <https://doi.org/10.1134/S0021364007100049> [WoS & Scopus, Quartile: Q2]
- 15) Alexander S. Kovalev, **Igor V. Gerasimchuk**, and Gerard A. Maugin, *Nonlinear Dynamics of Incommensurate Surface Layers*, **Physical Review Letters**, 2004, Vol. 92, No. 24, Pp. 244101-4. <https://doi.org/10.1103/PhysRevLett.92.244101> [WoS & Scopus, Quartile: Q1]
- 16) **I.V. Gerasimchuk** and A.S. Kovalev, *Localization of Nonlinear Waves between Interfaces*, **Phys. Sol. State**, 2003, Vol. 45, No. 6, Pp. 1141–1144. <https://doi.org/10.1134/1.1583805> [WoS & Scopus, Quartile: Q3]
- 17) A.S. Kovalev and **I.V. Gerasimchuk**, *Nonlinear Localization of Excitations and the Dynamics of Solitons in Self-Modulated Systems*, **Journal of Experimental and Theoretical Physics**, 2002, Vol. 95, No. 5, Pp. 965–972. <https://doi.org/10.1134/1.1528689> [WoS & Scopus, Quartile: Q3]
- 18) **I.V. Gerasimchuk** and A.S. Kovalev, *Spatial Localization of Light Flux in an Array of Nonlinear Optical Waveguides*, **J. Phys.: Condens. Matter**, 2001, Vol. 13, No. 44, Pp. L885–L889. <https://doi.org/10.1088/0953-8984/13/44/101> [WoS & Scopus, Quartile: Q1]
- 19) **I.V. Gerasimchuk** and A.S. Kovalev, *Localization of Nonlinear Waves in Layered Media*, **Low Temp. Phys.**, 2000, Vol. 26, No. 8, Pp. 586–593. <https://doi.org/10.1063/1.1289129> [WoS &

Scopus, Quartile: Q3]

- 20) M.M. Bogdan, **I.V. Gerasimchuk** and A.S. Kovalev, *Dynamics and Stability of Localized Modes in Nonlinear Media with Point Defects*, **Low Temp. Phys.**, 1997, Vol. 23, No. 2, Pp. 145–152. <https://doi.org/10.1063/1.593346> [WoS & Scopus, Quartile: Q3]