

# Viktoriia KHIST

Senior Research Fellow, PhD in Physics

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*Curriculum Vitae*

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## Personal Data and Contacts

**Birth date** 1980, September 2

**Nationality** Ukrainian

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## Background and objectives

My field of expertise is a comprehensive theoretical study of the phase diagram of nanomaterials, namely films, nanoparticles of different geometric shapes, and the calculation of magnetic and ferroelectric properties absent in bulk materials. It was first developed the theory of the magnetic properties emergence in thin films of non-magnetic binary oxides. A comparison between theory and experiment is performed and it is shown that the theory describes quite well the experiment in  $\text{SnO}_2$  films. The dependence of the magnetization versus temperature is obtained for various film-substrate mismatch.

The interaction between antiferrodistorsive structural order parameter (rotations of the oxygen octahedra), polarization and magnetization in nanotubes and nanowires of solid solutions  $\text{Eu}_x\text{Sr}_{1-x}\text{TiO}_3$  is studied. It was first calculated the phase diagram of nanotubes and nanowires  $\text{Eu}_x\text{Sr}_{1-x}\text{TiO}_3$ . It is shown that the phase diagrams include antiferrodistorsive, ferromagnetic and antiferromagnetic phases.

The flexomagnetic effect of macro-and ferroelectric nanostructures - ferromagnetic, ferroelectric - antiferromagnet is analytically studied within the framework of the phenomenological approach. The possibility of a new linear flexomagnetoelectric (PME) coupling in bulk and nanoscale materials with the flexomagnetic effect is demonstrated.

## Education

<b>Education/Training name/place</b>	<b>Degree, year, diploma N</b>	<b>Year(s)</b>	<b>Field of study, M.Sc., PhD and DrSc advisors, diploma title</b>
<b>Undergraduate education:</b> Taurida National V.I.Vernadsky University, Faculty of Physics	<b>M. Sc., 2003</b> (Honor Degree in Physics) KP № 22980404 Dated 26 June 2003	1998-2003	<b>Field of study:</b> student in physics, the department of solid-state physics. <b>M. Sc. thesis advisor:</b> Prof. M.B. Strugatskiy <b>M. Sc. thesis title:</b> Effect of pressure on magnetic state of iron borate.
<b>Undergraduate education:</b> State Higher Educational Institution Education Management University National Academy of Pedagogical Sciences of Ukraine	<b>M. Sc., 2009</b> (Honor Degree in Pedagogy) KB № 37510668 Dated 12 Oktober 2009	2008-2009	<b>Field of study:</b> student in pedagogy, the department of pedagogy of higher education. <b>M. Sc. thesis advisor:</b> Prof. V.I. Maslov <b>M. Sc. thesis title:</b> Teaching physics with Using Modeling and Simulations
<b>Ph.D. training:</b> Frantsevich Institute for Problems of Materials Science of National Academy of Science of Ukraine	<b>Ph. D., 2014</b> (Solid state physics, theoretical physics) ДК 023421 Dated 23 September 2014	2011-2014	Ph.D. student in Solid state physics, theoretical physics. <b>Ph. D. thesis advisor:</b> M.D. Glinchuk, Doctor of Science and Professor of Physics <b>Ph. D. thesis title:</b> Phase transitions induced by nanomaterials sizes, magnetic and ferroelectric properties that are absent in bulk materials.

## Professional Experience

**May 2016 –present**

*Senior Research Fellow in the Institute of Magnetism (IMAG) National Academy of Sciences of Ukraine and Ministry of Education and Science of Ukraine*

**September 2014 – July 2015**

*Senior Lecturer in the National University of Water and Environmental Engineering*

**July 2011– September 2014**

*Staff scientific researcher in the Department of theoretical physics in the Frantsevich Institute for Problems of Materials Science of National Academy of Science of Ukraine*

**September 2003 — July 2011**

*The teacher, Methodist College in the Crimean Republican Higher Educational Institution "Simferopol College of Radio Electronics" - the school I-II levels of accreditation*

## Awards

- 2012-2014 – Prize of the President of Ukraine for young scientists.
- 2016 – Award of the Verkhovna Rada of Ukraine to the most talented young scientists in the field of fundamental and applied researches and scientific and technical developments.
- 2017 - Participation Grant of "Graphene-on-ferroelectricity for the latest cells of nonvolatile memory and sensitive sensors".

## Research areas:

- surface effects in ferroelectrics, multiferroics, their local properties and domain structure, interfaces effects, flexoelectricity
- theoretical study of the phase diagram of nanomaterials, namely films, nanoparticles and the calculation of magnetic and ferroelectric properties absent in bulk materials

## Selected publications

1. Anna N Morozovska, Victoria V Khist, Maya D Glinchuk, Christian M Scherbakov, Maxim V Silibin, Dmitry V Karpinsky, Eugene A Eliseev, Flexoelectricity induced spatially modulated phases in ferroics and liquid crystals, **Journal of Molecular Liquids** 052.01.2018.
2. Eugene A Eliseev, Victoria V Khist, Yevhen M Fomichov, Maxim V Silibin, George S Svechnikov, Andrei L Kholkin, Dmitry V Karpinsky, Vladimir V Shvartsman, Anna N Morozovska, Fixed volume effect on polar properties and phase diagrams of ferroelectric semi-ellipsoidal nanoparticles, **The European Physical Journal B** 91, 7, 150 (2018).
3. Victoria V Khist, Eugene A Eliseev, Maya D Glinchuk, Maxim V Silibin, Dmitry V Karpinsky, Anna N Morozovska. Size effects of ferroelectric and magnetoelectric properties of semi-ellipsoidal bismuth ferrite nanoparticles, **Journal of Alloys and Compounds** 714, 303-310 (2017).
4. Anna N Morozovska, Victoria V Khist, Maya D Glinchuk, Venkatraman Gopalan, Eugene A Eliseev. Linear antiferrodistortive-antiferromagnetic effect in multiferroics: Physical manifestations, **Physical Review B** 92, 054421 (2015).
5. EA Eliseev, MD Glinchuk, V Khist, VV Skorokhod, R Blinc, AN Morozovska. Linear magnetoelectric coupling and ferroelectricity induced by the flexomagnetic effect in ferroics, **Physical Review B** 84, 174112 (2011).