**CURRICULUM VITAE**

**Olena Tartakivska**

**(Elena Tartakovskaya)**

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**Scientific interests:** theoretical physics**,** magnetic nanostructures, phase transitions, nonlinear excitations.

**Degrees (Educational background):**

**2012 - D.Sc.** (Habilitation) in Physics (Magnetism), Institute of Magnetism National Academy of Sciences of Ukraine, Kiev, Ukraine. Thesis title: ***Magnetic phase transitions and elementary excitations in nanosystems with long-range interactions***

**1988 - PhD** in Physics (Theoretical and Mathematical Physics), Institute of Metal Physics National Academy of Sciences of Ukraine, Kiev, Ukraine. Thesis title: ***Relaxation of solitons of the kink-type in quasi-one-dimensional crystals***

**1983 - M.Sc.,** in Physics (Nuclear Physics and Nuclear Theory**),** Physics Department, Kiev National University, Kiev, Ukraine. Thesis: ***Reconstruction of the nucleon-nucleon potential from experimental scattering phases.***

**The most important publications**

1. **Standing spin waves in perpendicularly magnetized triangular dots.** Julia Kharlan, Pavlo Bondarenko, Maciej Krawczyk, Olga Salyuk, Elena Tartakovskaya, Aleksandra Trzaskowska, and Vladimir Golub Phys. Rev. B **100**, 184416, 2019
2. **Complex Three-Dimensional Magnetic Ordering in Segmented Nanowire Arrays.** Alexander J. Grutter, Kathryn L. Krycka, Elena V. Tartakovskaya, Julie A. Borchers, K. Sai Madhukar Reddy, Eduardo Ortega, Arturo Ponce, and Bethanie J. H. Stadler, ACS Nano, 2017, 11 (8), pp 8311–8319.
3. **Spin-wave localization in tangentially magnetized films.** Elena V. Tartakovskaya, Martha Pardavi-Horvath, and Robert D. McMichael, Phys. Rev. B **93**, 214436, 2016.
4. **Splitting of standing spin-wave modes in circular submicron ferromagnetic dot under axial symmetry violation.** Bunyaev S. A., Golub V. O., Salyuk O. Yu., Tartakovskaya E. V., Santos N. M., Timopheev A. A.,Sobolev N. A.,Serga A. A.,Chumak A. V.,Hillebrands B., and Kakazei G. N., Scientific Reports **5**, 18480, 2015.
5. **Spin wave modes in out-of-plane magnetized nanorings.** X. Zhou, E. V. Tartakovskaya, G. N. Kakazei, and A. O. Adeyeye, Phys. Rev. B 96, 024446 (2017)
6. **Quantized spin-wave modes in long cylindrical ferromagnetic nanowires in a transverse external magnetic field***,* E.V.Tartakovskaya, Phys. Rev. B.**71** (R), 180404, 2005.

**Book chapter**

**Spin waves and electromagnetic waves in magnetic nanowires**,.Pardavi-Horvath M. and Tartakovskaya E.V., in *Magnetic Nano- and Microwires, Design, synthesis, properties and applications*, Ch. 23, Ed.Vázquez M., Woodhead Publishing Series in Electronic and Optical Materials, June 2015, Cambridge, UK, ISBN-13: 978-0081001646; Second Edition: ISBN 978-0-08-102832-2 , Pub. Date: April 2020

**The most important invited talks**

1. **"Spin-wave localization in tangentially magnetized films"**
   November 30, 2016, Institute of Materials Science, CSIC Madrid, Spain.
2. **"Spin-wave splitting in nanoparticles (nanowires, nanodots, nanorings)"**
   December 7, 2016, Departamento de Física de Materiales Universidad del País Vasco, San Sebastian, Spain.
3. **"Magnetic properties of thin films and multilayers investigated by neutron scattering techniques."**
   April 18, 2014, Wayne State University, Detroit, USA.
4. **"Non-collinear magnetic structures and reorientation phase transitions in FePtRh thin films: experimental results and theoretical model"**
   November 17, 2011, Institutionen för fysik och astronomi, Uppsala Universitet .

## Current Research Interests

- Analytical description of vortex dynamics in circular ferromagnetic nanodots; in collaboration with Universidad del País Vasco, San Sebastian, Spain, IFIMUP and IN-Institute of Nanoscience and Nanotechnology, Departamento de Física, Universidade do Porto, Portugal.
- Spin wave localization and Bloch oscillations in magnonic crystals due to a gradient of magnetic field; in collaboration with University of Exeter, United Kingdom.
- Theoretical explanation of broadband ferromagnetic resonance spectroscopy data in arrays of planar rings; in collaboration with experimental groups from Department of Electrical and Computer Engineering, National University of Singapore and IFIMUP and IN-Institute of Nanoscience and Nanotechnology, Departamento de Física, Universidade do Porto, Portugal..

**Teaching Experience:**
**professor of the Institute of High Technologies of Kiev National University since 2012 year.**

**1. Synergetics: Non-linear models of self-organization in physics, chemistry and biology.**
This is the general course completing the education addressed to students of the 6th year of study. The course is based on last achievements in physics, chemistry and biology, which were published in journals like Nature, Science, Phys Rev Letters, etc. The examples of the subjects of the course are: the common features of Kuramoto model and models of magnetism; auto-oscillating reactions; deterministic chaos; fractals in physics, chemistry and biology; Lorenz attractor in lasers and Rayleigh–Bénard convection; the reaction-diffusion model of Alan Turing in chemistry, physics and modern genetics. The main goal of the course is to show the common mathematical background (actually, this is the theory of nonlinear oscillations in dynamical systems) for different fields of modern science, and to reveal the students' independent learning skills for future scientific work.

**Professional experience:**

**2013- present time Permanent position**
Leading Research Scientist, Institute of Magnetism National Academy of Sciences of Ukraine, Kiev
**2001-2013**
Senior Scientist, Institute of Magnetism National Academy of Sciences of Ukraine, Kiev

**1996 – 2001**
Scientist, Institute of Magnetism National Academy of Sciences of Ukraine, Kiev, Ukraine

**1988 - 1996**
Scientist, Institute of Metal Physics National Academy of Sciences of Ukraine, Kiev, Ukraine.

**1985 - 1988**
Research Engineer, Institute of Metal Physics National Academy of Sciences of Ukraine, Kiev, Ukraine

**1983-1985**
Research Engineer, Institute of Theoretical Physics of National Academy of Sciences of Ukraine, Kiev, Ukraine

**Visits and fellowships**
**June 2018 – July 2018**
Visiting Scientist University of Exeter, United Kingdom

**November 2016 – December 2016**
Visiting Scientist Universidad del País Vasco, San Sebastian, Spain

**November 2013 – August 2014**
Fulbright fellowship in George Washington University, USA, and NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, USA.

**November 2010 – March 2011**
Visiting Scientist Helmholtz-Zentrum, Geesthacht, Germany

**January 2009 – April 2009, November 2009 – March 2010**
Visiting Scientist GKSS Research Center, Geesthacht, Germany

**December 2007 – February 2008**
Visiting Scientist GKSS Research Center, Geesthacht, Germany

**January 2007 – March 2007**
Visiting Scientist GKSS Research Center, Geesthacht, Germany

**April 2006 – May 2006**
Visiting Scientist GKSS Research Center, Geesthacht, Germany

**A short description of last major accomplishments**

1. Theoretical description of magnetic structures and PASANS data in ordered arrays of multilayered galfenol nanowires; in collaboration with NIST Center for Neutron Research and University of Minnesota, USA. The results were published in ACS Nano.

2. Theoretical description of experiments on local ferromagnetic resonance imaging with magnetic resonance force microscopy (FMRFM), has been developed in collaboration with National Institute of Standards and Technology (NIST), Gaithersburg, USA and with George Washington University, USA. The results were published in Physical Review B.

3. Theoretical explanation of splitting of spin-wave modes in the case of symmetry violation in ferromagnetic wires and circular dots. Theory is in good agreement with experimental data. The results were published in Scientific Reports and in Physical Review B.

4. A phenomenological theory describing reorientation phase transitions and magnon dynamics in two-dimensional and three-dimensional magnonic crystals (ordered arrays of interacting cylindrical nanowires and nanospheres) has been developed. The theory explains experimental results obtained in George Washington University (USA) and Instituto de Ciencia de Materiales de Madrid (Spain). The main results of this research were published in Physical Review B, Journal of Applied Physics and Journal of Magnetism and Magnetic Materials.

5. A microscopic theory describing magnetic dynamics in one-dimensional magnonic crystals (multilayers) has been developed. Using the results of this theory, a set of the experiments on neutron facilities in ILL (France) and Helmholtz-Zentrum, Geesthacht (Germany) was planned and realized. The results of the experiments approved quantitatively the theoretical predictions. The main results of this research have been published in Applied Physics Letters and in Physical Review B.

6. Theoretical description of magnetic properties of FePtRh films and the experimentally observed reorientation phase transitions in such thin films with itinerant magnetism is presented. The results, obtained in collaboration with Helmholtz-Zentrum and Juelich Research Center, Institute for Research on Solid State Physics (Germany), MINT Center, University of Alabama (USA) and Australian Nuclear Science and Technology Organisation (Australia), were published in Physical Review B and Journal of Applied Crystallography.

7. Theoretical explanations of polarized neutron data on field-induced chirality in rare-earth multilayers; in collaboration with Helmholtz-Zentrum, Geesthacht, Germany. The main results of this research were published in Physical Review B, and Journal of Magnetism and Magnetic Materials.

**List of References**

1. Prof. Konstyantin Guslienko
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2. Martha Pardavi-Horvath
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3. Boris Ivanov
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Supplementary material

## List of Articles

**1. Wannier-Stark ladder spectrum of Bloch oscillations of magneto-dipole spin waves in graded 1D magnonic crystals.** E. V. Tartakovskaya, A. S. Laurenson and V. V. Kruglyak Low Temperature Physics 46, 830 (2020); https://doi.org/10.1063/10.0001550

**2. Standing spin waves in perpendicularly magnetized triangular dots.** Julia Kharlan, Pavlo Bondarenko, Maciej Krawczyk, Olga Salyuk, Elena Tartakovskaya, Aleksandra Trzaskowska, and Vladimir Golub Phys. Rev. B 100, 184416, (2019)

**3. Coherent charge and magnetic ordering in Ho/Y superlattice revealed by element-selective x-ray scattering.** V. Ukleev, V. Tarnavich, E. Tartakovskaya, D. Lott, V. Kapaklis, A. Oleshkevych, P. Gargiani, M. Valvidares, J. S. White, and S. V. Grigoriev Phys. Rev. B 100, 134417 (2019)

**4. Complex Three-Dimensional Magnetic Ordering in Segmented Nanowire Arrays.** Alexander J. Grutter, Kathryn L. Krycka, Elena V. Tartakovskaya, Julie A. Borchers, K. Sai Madhukar Reddy, Eduardo Ortega, Arturo Ponce, and Bethanie J. H. Stadler, ACS Nano, 2017, 11 (8), pp 8311–8319.

**5. Magnetic field induced chirality in Ho/Y multilayers with gradually decreasing anisotropy.** V. Tarnavich, E. Tartakovskaya, Yu. Chetverikov, V. Golub, D. Lott, Yu. Chernenkov, A. Devishvili, V. Ukleev, V. Kapaklis, A. Oleshkevych, V. Fedorov, V. Bairamukov, A. Vorobiev, and S. Grigoriev. Phys. Rev. B 96, 014415 (2017).

**6. Spin wave modes in out-of-plane magnetized nanorings.** X. Zhou, E. V. Tartakovskaya, G. N. Kakazei, and A. O. Adeyeye, Phys. Rev. B 96, 024446 (2017)

**7. Spin-wave localization in tangentially magnetized films.** Elena V. Tartakovskaya, Martha Pardavi-Horvath, and Robert D. McMichael, Phys. Rev. B **93**, 214436, 2016.

**8. Splitting of standing spin-wave modes in circular submicron ferromagnetic dot under axial symmetry violation.** Bunyaev S. A., Golub V. O., Salyuk O. Yu., Tartakovskaya E. V., Santos N. M., Timopheev A. A.,Sobolev N. A.,Serga A. A.,Chumak A. V.,Hillebrands B.,Kakazei G. N., ***Scientific Reports*** (2015) | 5:18480 | DOI: 10.1038/srep18480

**9. Magnetic order and phase transitions in $Fe_{50}Pt_{50-x}Rh_x$.**
J. Fenske, D. Lott, E. V. Tartakovskaya, H. Lee, P. R. LeClair, G. J. Mankey, W. Schmidt, K. Schmalzl, F. Klose and A. Schreyer, ***J. Appl. Cryst.*** (2015). 48, 1142-1158 doi:10.1107/S1600576715011462

**10. Spin waves and electromagnetic waves in magnetic nanowires**,.Pardavi-Horvath M. and Tartakovskaya E. V, in *Magnetic Nano- and Microwires, Design, synthesis, properties and applications*, Ch. 23, Ed.Vázquez M., Woodhead Publishing Series in Electronic and Optical Materials, June 2015, Cambridge, UK, ISBN-13: 978-0081001646

**11. Field induced spin chirality and chirality switching in magnetic multilayers.**
Elena V. Tartakovskaya, JMMM, 381 (2015) 267-270.

**12. Standing spin waves in perpendicularly magnetized circular dots at millimeter waves.**
S. V. Nedukh, S. I. Tarapov, D. P. Belozorov, A. A. Kharchenko, V. O. Golub, I. V. Kilimchuk, O. Y. Salyuk, E. V. Tartakovskaya, S. A. Bunyaev and G. N. Kakazei
J. Appl. Phys. **113**, 17B521 (2013); http://dx.doi.org/10.1063/1.4799528

**13. Probing dynamical magnetization pinning in circular dot as a function of the external magnetic field orientation.**
G. N. Kakazei G. R. Aranda, S. A. Bunyaev, V. O. Golub, E. V. Tartakovskaya, A. V. Chumak, A. A. Serga, B. Hillebrands, and K. Y. Guslienko, Phys. Rev. B **86**, 054419 (2012).

**14. Neutron scattering measurements of magnetic excitations in Gd/Y superlattices**.
A.T.D. Grünwald, A.R. Wildes, W. Schmidt, E.V. Tartakovskaya, G. Nowak, K. Theis-Bröhl, and A.Schreyer, Appl. Phys. Lett. **96**, 192505, 2010.

**15. Magnetic excitations in Dy/Y superlattices as seen via inelastic neutron scattering.** A.T.D. Grünwald, A.R. Wildes, W. Schmidt, E.V. Tartakovskaya, J. Kwo, C. Majkrzak, R.C.C. Ward, and A. Schreyer, Phys. Rev. B **82**, 014426, 2010.

**16. Reorientation phase transitions in planar arrays of dipolarly interacting ferromagnetic particles.**
E.V. Tartakovskaya,
Journal of Magnetism and Magnetic Materials, 322 (2010) 3495–3501
**17. Spin-reorientation phase transition in self-ordered arrays of magnetic nanowires.**
E.V. Tartakovskaya, M. Pardavi-Horvath, M. Vazquez Villalabeitia,
Journal of Magnetism and Magnetic Materials 322 (2010) 743–747.
**18. Antiferromagnetism in a Fe50Pt40Rh10 thin film investigated using neutron diffraction.**
D. Lott, J. Fenske, A. Schreyer , P. Mani, G.J. Mankey, F. Klose, W.Schmidt, K. Schmalzl and E.V.Tartakovskaya
Phys. Rev. B **78**, 174413 , 2008
**19. Dipolar interaction in ordered superlattices of ferromagnetic nanoparticles**.
E. Tartakovskaya, A.Vovk, V. Golub
Phys. Stat. Sol. (a) **205,** 1787, 2008.
**20. Spin wave dynamics in two- and three- dimensional superlattices of nanosized ferromagnetic spheres.**
E. Tartakovskaya, W. Kreuzpaintner, and A. Schreyer,
J. Appl. Phys. **103**, 023913, 2008.
**21. Collective excitations in layered systems with complicated magnetic order.**
E. V. Tartakovskaya,
Metallofiz, Novejshie Tekhnol., **29,** 1433, 2007.
**22. Dipolar-exchange theory of quantized spin-wave modes: Calculations of inelastic neutron scattering cross section in arrays of ferromagnetic nanowires.**
E.V.Tartakovskaya,
Phys.Rev.B **73**, 092415, 2006.
**23. Inelastic neutron scattering cross section in ferromagnetic nanowires**
E.V. Tartakovskaya,
Physica B: Condenced Matter, Volumes 385-386, p.468, 2006.
**24.Quantized spin-wave modes in long cylindrical ferromagnetic nanowires in a transverse external magnetic field,**
E.V.Tartakovskaya,
Phys. Rev. B v.71 (R), p.180404, 2005
**25.New micromagnetic states of magnetically soft nanoparticles with a nearly cubic shape**.
B.A.Ivanov, E.V.Tartakovskaya
JETP v.98, pp.1015-1026, 2004
**26. New micromagnetic states in nonellipsoidal nanoparticles .**
E.V.Tartakovskaya, J.W.Tucker and B.A.Ivanov
JMMM v.272-276, Supplement 1, E1165, 2004.
**27. Self-consistent theory and simulation of quasi-uniform states in thin rectangular magnetic nanoparticles.**
Tartakovskaya E. V., Tucker J. W., Ivanov B. A.
J. of Appl. Phys., v.89, pp.8348-8350, 2001.
**28. Theory of quasi-uniform states of small magnetic particles**,
E. V. Tartakovskaya and B. A. Ivanov,
Mat. Sci. Forum. **373 - 376**, 213 ,2001
**29. Surface waves in elastic band-gap composites.**
Tartakovskaya E. V.
Phys. Rev. B, v.62, pp.11225-11229, 2000.
**30. Oscillating exchange and spin wave stiffness in magnetic monolayers.**
Kambersky V., Ivanov B. A., Tartakovskaya E. V.
Phys. Rev. B, v.59, pp.149-152, 1999.
**31. Spin-phonon interaction in thin magnetic films.**
Tartakovskaya E. V., Ivanov B. A.
Physica B Cond. Matt., v.263-264, pp.769-771, 1999.
**32. On the existence of long-range magnetic order in two-dimensional easy-plane magnets**.
Ivanov B. A., Tartakovskaya E. V.
Low Temperature Phys., v.24, pp.823-830, 1998.
**33. Magnetoelastic stabilization of long-range magnetic order in two-dimensional easy-plane magnets**.
Ivanov B. A., Tartakovskaya E. V.
JETP Lett., v.63, pp.792-796, 1996.
**34. Stabilization of long-range magnetic order in 2D easy-plane antiferromagnets**
Ivanov B. A., Tartakovskaya E. V.
Phys. Rev. Lett., **77**, 386, 1996.

**35. Diffusion, relaxation, and response functions of solitons in one-dimensional antiferromagnets**.
B. A. Ivanov, A. K. Kolezhuk, and E. V. Tartakovskaya.
J. Phys. : Condensed Matter, v. **5**, 7737, 1993.

**36. Stability of domain boundaries in a highly anisotropic ferromagnet with a unit spin.**
B.A.Ivanov, A.N.Kichizhiev, E.V.Tartakovskaya.
Ukr. Fiz. Zh., **37**, 1039, 1992.

**37. Nonequilibrium thermodynamics of a gas of solitons of kink type in quasi one-dimensional systems.**
Bar'yakhtar V.G Ivanov B.A Sukstanskii A.L Tartakovskaya E.V
Teoreticheskaya i Matematicheskaya Fizika, **74**(1),46, 1988

**38. Dynamics of domain walls of a ferromagnet in an external magnetic field**.
Ivanov B.A, Krasnov V.P, Tartakovskaya E.V
Pis'Ma V Zhurnal Tekhnicheskoi Fizika, **13**, 341, 1987 (Sov. Tech. Phys. Lett. **13**, 139 (1987)).

**39. Relaxation of kink-type solitons in quasi-one-dimensional antiferromagnet.**
Ivanov B.A Sukstansky A.L Tartakovskaya E.V.
Fizika Nizkikh Temperatur, **13**(9):982, 1987
(Sov. J. Low Temp. Phys. **13**, 560 (1987)).

**40. Phonon relaxation of kink-type solitons in quasi-one-dimensional ordered systems.**
Ivanov B.A Tartakovskaya E.V
Fizika Nizkikh Temperatur, **12**(10):1087, 1986.
(Sov. J. Low Temp. Phys. **12**, 613 (1986))

**41. Phonon relaxation of domain boundaries in one-dimensional rhombic ferromagnet.**
E.V. Tartakovskaya
Ukrainskii Fizicheskii Zhurnal, **32**(9):1364, 1987.

**42. Reconstruction of the nucleon-nucleon potential from experimental scattering phases.**
Petrov N.M. Tartakovskaya E.V.
Izvestiya Akademii Nauk SSSR Seriya Fizicheskaya, **48**(10), p. 1978, 1984.