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EDUCATION

Belarusian State University Minsk, Belarus
Dr. Hab., Condensed matter 2013
Dissertation: Local atomic order, charge transfer and magnetic state of stabilized nanocomposites ferromagnetic alloy-insulator

Belarusian State University Minsk, Belarus &
Niewodniczanski Institute of Nuclear Physics Cracow, Poland, 1998
PhD, Solid state physics
Dissertation: Local order in Fe-B-N system formed by sequential implantation of boron and nitrogen into iron films

Belarusian State University Minsk, Belarus
MSc 1994

GRANTS AND AWARDS

Grant of EU COST Action MP0903 2012
Institute of Nuclear Sciences VINCA

CNRS grants 2007-2010
University of Poitiers

Invited researcher fellowship of Poitou-Charentes 2006
University of La Rochelle

Grant DAAD 2005
University of Gottingen

INTAS fellowship 2002
Padova University

Grant of Queen's Jadwiga Foundation 2001
Jagiellonian University

Grant of Mianowski Foundation 1999
Jagiellonian University

RESEARCH EXPERIENCE

NC PHEP BSU Belarusian State University
Head of the Lab "Physics of prospective materials" 2008 – Present

Structural characterization, magnetic properties and charge transfer in nanocomposites and nanostructured materials
– New technological approach for synthesis of metal-insulator nanocomposite films in reactive gases to stabilize granular structure of films.

– Characterization of oxidation sequence of magnetic alloy nanoparticles (MNPs) as a function of insulating matrixes chemical composition and synthesis regimes (XRD, TEM, HRTEM, Mössbauer spectroscopy, EXAFS, XANES).

– Effect of surface oxidation of MNPs on magnetic properties (VSM, SQUID), charge transfer and magnetoresistance; modeling of VRH AC conductivity.

– Magnetometry and characterization of charge transfer in template-assisted 3d-metal nanostructures (nanorods, nanowires).

– Characterization of magnetic properties of single and multi-walled carbon nanotubes (VSM, SQUID, Mössbauer spectroscopy).

NC PHEP BSU Belarusian State University

Senior researcher

2000 – 2007

– Study of the surface corrosion dynamics in multiphase nanostructured FeAl powder alloys prepared by reactive synthesis

– Early-stage oxidation diagnostics in Al and Al₂O₃-coated Fe powders and dense samples, based on magnetization, magnetoresistivity and local Fe states analysis

RECENT PROJECTS

2013-2015 Leader of National Project No 1.37 “Nanocomposite films with magnetic anisotropy for designing of magnetic memory and sensors”.

2013-2015 Leader of National Project No 2.4.10 “Designing of magnetic multilayered nanostructures on porous materials for designing of spintronic elements and information visualization”.

2010-2013 participant of the EU COST Action MP0903: “Nanoalloys as advanced materials: from structure to properties and applications”.

2011-2013 Leader of National Project No 1.16 “Designing of magnetic field sensors based on complimentary study of electrical conductivity, magnetoresistance and magnetic properties of granular films”.

2011-2013 Leader of National Project No 2.04.12. “Structure and magnetic properties of nanosized iron agglomerations inside carbon nanotubes and porous silicon”.

2011-2013 Leader of bilateral project with Serbia: “Matrix magnetically ordered Pt-Ni(Co), Pd-Ni(Co) nanostructures for nanoelectronic and spintronic devices of new type”.

2010-2012 Leader of bilateral project with Russia: “Nanocomposites with “core-shell” ferromagnetic nanoparticles in dielectric matrixes”.

2010-2012 Leader of bilateral project with Poland: “Spintronic metal-insulator composites with tailored magnetotransport properties”.

2009-2011 Leader of bilateral project with France (CNRS): “Physical principles of early-stage oxidation diagnostics in Al and Al₂O₃-coated Fe powders and dense samples, based on magnetization, magnetoresistivity and local Fe states analysis”.

2006–2010 Leader of National Project No 3.07: “Synthesis technology and study of composite films for designing of sensors, microcapacitances and microinductances”.

SELECTED INTERNATIONAL CONFERENCE PRESENTATIONS

S.Dubois, **J.Fedotova**, J.Nechaj et al (2008), Mössbauer characterization of as-prepared and oxidized Al-coated and Al₂O₃-coated iron particles, *oral presentation* at the Int. Conf. “Mössbauer spectroscopy in materials science”, Hlohovec, Czech Republic.

J. Fedotova et al (2008), Hydrogenation of FeCoZr-Al₂O₃ nanocomposites studied by Mössbauer spectroscopy and magnetometry, *oral presentation* at the Proc. Intern. Conf. on Industrial Application of Mossbauer Effect (ISIAME 2008), Budapest, Hungary.

J.Kasiuk, **J.Fedotova** et al (2010), Effect of «core-shell» structure on coupling between spin-dependent magnetoresistance and magnetization in FeCoZr oxide-Al₂O₃ granular nanocomposites, *oral presentation* at the 23rd General Conf. Condensed Matter Division of the European Physical Society, Warsaw, Poland.

J. Fedotova et al (2010), Spin-dependent magnetoresistance and magnetization in oxidized FeCoZr-Al₂O₃ granular nanocomposites with «core-shell» structure, *oral presentation* at the 12th Ann. Conf. YUCOMAT-2010, Herceg Novi, Montenegro.

J. Fedotova (2012), Metal-insulator nanostructured films for magnetoelectronic devices: properties and application, *invited talk* at the 56th Internationales Wissenschaftliches Kolloquium Ilmenau University of Technology, Ilmenau, Germany.

J. Fedotova (2013) Tailored magnetic and electric states in 3d-metal – insulator films: characterization and application, *invited talk* at the XLVIII Zakopane School of Physics “Breaking Frontiers: Submicron Structures in Physics and Biology”, Zakopane.

RECENT PEER-REVIEWED PUBLICATIONS

- J. Fedotova**, G. Bonnet, F. Pedraza, J. Balmain, S. Dubois et al. Effect of lamellar microstructure on oxidation kinetics of Fe₃Al sintered by high isostatic pressing. *Corrosion science* 50 (6) (2008) 1693.
- J.A. Fedotova**. FeCoZr-Al₂O₃ granular nanocomposite films with tailored structural, electric, magnetotransport and magnetic properties, in “*Advances in Nanoscale Magnetism*”, Chapter 13, Springer.- 2008.- p. 231-367.
- A. Saad, **J. Fedotova**, J. Nechaj, E. Szilagy, M. Marszalek. Tuning of magnetic properties and structure of granular FeCoZr-Al₂O₃ nanocomposites by oxygen incorporation. *J. All. Comp.* 471 (1-2) (2009) 357.
- J. Fedotova**, J. Kasiuk, J. Przewoznik, Cz. Kapusta, I. Svito, Yu. Kalinin, A. Sitnikov. Effect of oxide shells on the magnetic and magnetotransport characteristics of oxidized FeCoZr nanogranules in Al₂O₃. *J. Alloys Compds.* 509 (2011) 9869.
- J. Fedotova**, J. Przewoznik, Cz. Kapusta et al. Magnetoresistance in FeCoZr-Al₂O₃ nanocomposite films containing “metal core-oxide shell” nanogranules. *J. Phys. D: Appl. Phys.* 44 (2011) 495001-1.
- T. N. Koltunowicz, **J. Fedotova**, P. Zhukowski, A. Saad, A. Fedotov, J. V. Kasiuk, A. V. Larkin. Negative capacitance in (FeCoZr)-(PZT) nanocomposite films. *J. Phys. D: Appl. Phys.* 46 (2013) 125304.
- Komissarov, Yu. Shaman, **J. Fedotova** et al. Structural and magnetic investigation of single wall carbon nanotube films with iron based nanoparticles inclusions synthesized by CVD technique from ferrocene/ethanol solution. *Physica Status Solidi C* 10, No. 7–8 (2013) 1176–1179
- T.N. Koltunowicz, P. Zukowski, M. Milosavljević, A.M. Saad, J.V. Kasiuk, **J.A. Fedotova**, Yu.E. Kalinin, A.V. Sitnikov, A.K. Fedotov. AC/DC conductance in granular nanocomposite films (Fe₄₅Co₄₅Zr₁₀)_x(CaF₂)_{100-x}. *J. Alloys Compds.* 586, Suppl. 1 (2014) S432.
- J.V. Kasiuk, **J.A. Fedotova**, T.N. Koltunowicz, P. Zukowski, A.M. Saad, J. Przewoznik, Cz. Kapusta, J. Zukowski, I.A. Svito. Correlation between local Fe states and magnetoresistivity in granular films containing FeCoZr nanoparticles embedded into oxygen-free dielectric matrix. *J. Alloys Compds.* 586, Suppl. 1 (2014) S353.
- T.N. Koltunowicz, P. Zukowski, M. Milosavljević, A.M. Saad, J.V. Kasiuk, **J.A. Fedotova**, Yu.E. Kalinin, A.V. Sitnikov, A.K. Fedotov. AC/DC conductance in granular nanocomposite films (Fe₄₅Co₄₅Zr₁₀)_x(CaF₂)_{100-x}. *J. Alloys Compds.* (2014) vol. 586, p. S353-S356. <http://dx.doi.org/10.1016/j.jallcom.2012.09.121>.
- J.A. Fedotova**. Effect of matrix onto oxidation of metallic nanoparticles in metal-insulator nanocomposite films, *Acta Physica Polonica A* 125, N 6 (2014) 1418.
- T.N. Koltunowicz, P. Zhukowski, V. Bondariev, A. Saad, **J.A. Fedotova**, A.K. Fedotov, M. Milosavljević, J.V. Kasiuk. Enhancement of negative capacitance effect in (CoFeZr)_x(CaF₂)_{100-x} nanocomposite films deposited by ion beam sputtering in argon and oxygen atmosphere, *J. Alloys Compds.* (2014) (accepted).
- S.L. Prischepa, A.L. Dolgiy, A.V. Bandarenka, V.P. Bondarenko, K.I. Yanushkevich, V.G. Baev, A.A. Maximenko, **Yu.A. Fedotova**, A. Zarzycki, Y. Zabala. Synthesis and properties of Ni nanowires in porous silicon templates, in: “Nanowires”, Nova Science Publishers (New York), ed. Luke J. Wilson (2014) pp. 89-128.
- J.A. Fedotova**. Tailored magnetic and electric states in 3d-metal – insulator films: characterization and applications, *Acta Physica Polonica A* 125, N 4 (2014) 944.
- J.V. Kasiuk, **J.A. Fedotova**, J. Przewoznik, J. Zukowski, M. Sikora, Cz. Kapusta, A. Grce and M. Milosavljević. Growth-induced non-planar magnetic anisotropy in FeCoZr-CaF₂ nanogranular films: structural and magnetic characterization, *J. Appl. Phys.* (2014) (accepted).