# CURRICULUM VITAE


## Dr. Alevtina Smekhova (Russian citizenship)

**WORK ADDRESS:**

Peter Grünberg Institut (PGI-6),
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## EDUCATION:

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| January 2001: | graduated from Faculty of Physics of M.V. Lomonosov Moscow State University (Chair of General Physics and Wave Process) with gold diploma; |
| April 2006: | PhD thesis defense; condensed matter physics, a title was: "The development of resonant X-ray reflectivity method near the $L_{2,3}$ absorption edges for investigations of magnetic multilayers" |

## PROFESSIONAL BACKGROUND:

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| since 05/2015 | post-doctoral scientist in Borderline Magnetism group at Peter Grünberg Institut (PGI-6), Forschungszentrum Jülich, 52425, Jülich; |
| 04/2014 – 04/2015: | post-doctoral scientist at Universität Duisburg-Essen, Fakultät für Physik, (Experimentalphysik, AG Wende) und CENIDE, 47048 Duisburg, Germany; |
| during 2014: | visiting scientist at the Laboratory of Magnetism of Low Dimension Systems (January-March, 2 months, L'IMPMC (UPMC, CNRS), Paris, France) within "Research in Paris 2013" program; |
| during 2013: | visiting scientist at the HZDR (April, 3 weeks, and November, 4 weeks Dresden, Germany) and DESY synchrotron (July-August, 2 months, Hamburg, Germany) within "Vladimir Vernadsky" MSU-DAAD Program; |
| during 2012: | visiting scientist (9 weeks) at the Helmholtz-Zentrum Dresden-Rossendorf (HZDR, Germany) at the Ion Beam Center as a PI of joint Helmholtz-Russia grant "Defects in magnetic $TiO_2$" (DETI.2) (Joint Research Group HRJRG-314 & the Russian Foundation for Basic Research, RFBR #12-02-91321-SIG_a; http://magn.ru/Rus/DETI2/index.htm; within the scientific call for joint Russian (RFBR) - German (Helmholtz Association) grants in 2011); |
| since March 2010: | senior researcher at the Chair of Solid State Physics, Faculty of Physics; Lomonosov Moscow State University (permanent position); |
| 2007 – 2010: | post-doctoral scientist at the European Synchrotron Radiation Facility (Electronic Structure & Magnetism group, ID12 beamline) in Grenoble (France); |
| 2006 – 2007: | researcher at the Chair of Solid State Physics, Moscow State University, Moscow (Russia); |
| 2004 – 01/2006: | postgraduate student at the Chair of Solid State Physics. Research in the field of resonant magnetic Bragg reflectivity (at absorption edges) from magnetic multilayers (theory and computer modeling). PhD thesis was defended in April 2006; |
| 2001 – 2002: | postgraduate student at the Chair of General Physics and Wave Process, but postgraduate program was suspend by external reasons |

**FIELDS OF SCIENTIFIC INTERESTS:**

Element-selective spectroscopies with synchrotron radiation; magnetic and electronic properties of thin films and nanostructures; X-Ray magnetic circular dichroism (XMCD) technique itself and its application for investigations of induced magnetic moment at non-magnetic atoms; DMS, multiferroics, magnetic superconductors, core-shell magnetic nanoparticles, Positron Annihilation Spectroscopy (PAS) for defects detection, ferromagnetism induced by ion irradiation

**HONORIES:**

- The diploma for the best report at the XII International conferences of students and young scientists on fundamental sciences "Lomonosov – 2005". Moscow. MSU. Russia. 2005;
- The 3rd degree diploma at the 2nd All-Russian youth scientific school "Micro-, nanotechnology and its applications". Chernogolovka. IPTM RAS. Russia. 2005;
- The award of the MSU rector grant on 2007 & 2011;
- The 1st young scientist prize of 45th PNPI School on Condensed State Physics "CSP – 2011" (St.Petersburg region, Russia)

**LIST OF PUBLICATIONS** (for the last 7 years)**:**

1. ***A. Smekhova****, N. Atamena, D. Ciuculescu, P. Lecante, F. Wilhelm, C. Amiens, A. Rogalev*, "XANES and XMCD studies of core-shell FeRh and CoRh nanoparticles", **J. of Physics.: Conference Series**, 200, p.072091 (2010)
2. *D. Ciuculescu, N. Atamena,* ***A. Smekhova****, F. Wilhelm, A. Rogalev, G. Alcaraz, B. Chaudret, P. Lecante, R. E. Benfield, C. Amiens*, "Organometallic control at the nanoscale: a new, one-pot method to decorate a magnetic nanoparticle surface with noble metal atoms", **Chem. Commun.**, 46, p.2453 (2010)
3. *C. Carvallo, Ph. Sainctavit, M.-A.Arrio, Y. Guyodo, R. L. Penn, B. Forsberg, A. Rogalev, F. Wilhelm, and* ***A. Smekhova***, "Self-reversal of magnetization in oceanic submarine basalts studied with XMCD", **Geophys. Res. Lett.**, 37, p. L11306 (2010)
4. ***A. Smekhova****, M.Andreeva, E.Odintsova, C.Dufour, K.Dumesnil, F.Wilhelm, A.Rogalev*, "Determination of the magnetic contribution to YFe2 susceptibility by means of X-Ray Resonant Magnetic Reflectivity"**,** Crystallography Reports**,** 55 (5), p. 906–915 (2010) (in Russian); **Crystallography Reports**, 55 (5), pp. 854–862 (2010) (English version)
5. *P. Wadley, A. A. Freeman, K. W. Edmonds, G. van der Laan, J. S. Chauhan, R. P. Campion, A. W. Rushforth, B. L. Gallagher, C. T. Foxon, F. Wilhelm,* ***A. G. Smekhova****, and A. Rogalev*, "Element-resolved orbital polarization in (III,Mn)As ferromagnetic semiconductors from *K*-edge x-ray magnetic circular dichroism", **Phys. Rev. B** 81, p.235208 (2010)
6. *M. Ungureanu, K. Dumesnil, C. Dufour, N. Gonzalez, F. Wilhelm,* ***A. Smekhova****, A. Rogalev*, "Using an original Zero-Magnetization Ferromagnet as pinning layer in exchange-bias systems", **Phys. Rev. B** 82, 174421 (2010)
7. *A.F. Orlov, L.A. Balagurov, I.V. Kulemanov, N.S. Perov, E.A.Gan'shina, L.V. Fetisov, A. Rogalev,* ***A. Smekhova****, J.C. Cezar*, "Intrinsic ferromagnetism in a semiconductor $Ti_{1-x}Co_xO_{2-\delta}$ created by oxygen vacancies injection", Physics of the Solid State, 53, p.452 (2011) (in Russian); **Physics of the Solid State**, 53 (3), pp. 482-484 (2011) (in English)
8. *S. Brossard, F. Volatron, L. Lisnard, M.-A. Arrio, L. Catala, C. Mathoniere, T. Mallah, Ch. C. dit Moulin, A. Rogalev, F. Wilhelm,* ***A. Smekhova****, and Ph. Sainctavit*, "Investigation of the Photoinduced Magnetization of Copper Octacyanomolybdates Nanoparticles by X-ray Magnetic Circular Dichroism", **J. Am. Chem. Soc**., 134 (1), pp 222–228 (2012)
9. ***A. Smekhova****, E. A. Gan'shina, B. S. Roschin, A. D. Gribova, M. A. Andreeva, F. Wilhelm, and A. Rogalev*, "Structural and Magnetic Studies of $[Co0.45Fe0.45Zr0.1/a\text{-}Si]_N$ Multilayers", **Journal of Spintronics and Magnetic Nanomaterials**, 1 (1), pp.11-17 (2012)
10. *A. Granovsky, A. Orlov, N. Perov, E. Gan'shina, A.Semisalova, L. Balagurov, I. Kulemanov, A. Sapelkin, A. Rogalev, and* ***A. Smekhova****,* "Above Room Temperature Ferromagnetism in Si:Mn and TiO2-δ:Co", **Journal of Nanoscience and Nanotechnology**, 12, pp. 7540-7544 (2012)
11. *A.F. Orlov, L.A. Balagurov, I.V. Kulemanov, E.A. Petrova, N.S. Perov, E.A. Gan'shina, L.Yu. Fetisov, A.S. Semisalova, A.I. Novikov, L.V. Yashina, A. Rogalev,* ***A. Smekhova****, A.V. Lashkul, E. Lahderanta*, "Magnetic and

magneto-optical properties of $Ti_{1-x}V_xO_{2-delta}$ semiconductor oxide films: room-temperature ferromagnetism versus resistivity, **SPIN**, v. 2 (2), 1250011 (6 pages) (2012)

12. ***A. Smekhova****, L.N. Fomicheva, A.V. Tsvyashchenko, V.A. Sidorov, A. Rogalev*, "New ternary boride $EuRh_4B_4$ synthesized under high pressure-temperature conditions", **Solid State Phenomena**, 190, pp.421-424 (2012)
13. *M. Butterling, W. Anwand, S. Cornelius, K. Potzger,* ***A. Smekhova****, M. Vinnichenko and A.Wagner*, "Optimization of growth parameters of TiO2 thin films using a slow positron beam", **Journal of Physics: Conference Series** 443, p.012073 (2013)
14. *O. Yildirim, M. Butterling, S. Cornelius, Yu. Mikhailovskiy, A.Novikov, A. Semisalova, A. Orlov, E. Gan'shina, N. Perov, W. Anwand, A.Wagner, K. Potzger, A.B. Granovsky and* ***A. Smekhova****,* "Ferromagnetism and structural defects in V-doped titanium dioxide", **PSS(c)** 11, p. 1106 (2014)
15. *E.A. Tereshina, O. Isnard,* ***A. Smekhova****, A.V. Andreev, A. Rogalev, S. Khmelevskyi,* "Experimental and theoretical study of magnetic ordering and local atomic polarization in Ru-substituted Lu2Fe17", **Phys. Rev. B** 89, p. 094420 (2014)
16. *Figueroa A.I., Bartolome J., Garc´ıa L.M., Bartolome F., Bunau O., Stankiewicz J., Ruiz L., Gonzalez-Calbet J.M., Petroff F., Deranlot C., Pascarelli S., Bencok P.,Brookes N.B., Wilhelm F.,* ***Smekhova A.****, Rogalev A.*, "Structural and magnetic properties of granular Co-Pt multilayers with perpendicular magnetic anisotropy", **Phys. Rev. B** 90, p. 174421 (2014)
17. *A. Semisalova, Y. O. Mikhailovsky,* ***A. Smekhova****, A.F. Orlov, N.S. Perov, E.A. Gan'shina, A. Lashkul, E. Lähderanta, K. Potzger, O. Yildirim, B. Aronzon, A.B. Granovsky*, "Above room temperature ferromagnetism in Co- and V- doped $TiO_{2-delta}$ - revealing the different contributions of defects and impurities, **Journal of Superconductivity and Novel Magnetism** 28, p.805 (2015)
18. *M.A. Andreeva, Yu.L. Repchenko,* ***A.G. Smekhova****, K. Dumesnil, F.Wilhelm, A. Rogalev*, "Asymmetric diffraction as a method of determining the magneto-optical constants for the X-ray absorption near edge", **JETP** 147, p.1128 (2015) (in Russian) and **JETP** 120, p.974-981 (2015) (in English)
19. *Yildirim O., Cornelius S.,* ***Smekhova A.****, Zhukov G., Gan`shina E.A., Granovsky A.B., Huebner R., Baehtz C., Potzger K.*, "The local environment of cobalt in amorphous, polycrystalline and epitaxial anatase TiO2:Co films produced by cobalt ion implantation", **J. Appl. Phys** 117, p. 183901 (2015)
20. *Liedke M.O., Anwand W., Bali R., Cornelius S., Butterling M., Trinh T.T., Wagner A., Salamon S., Walecki D.,* ***Smekhova A.****, Wende H., Potzger K.*, "Open volume defects and magnetic phase transition in Fe60Al40 transition metal aluminide", **J. Appl. Phys** 117, p. 163908 (2015)
21. *O. Yildirim, S. Cornelius, M. Butterling, W. Anwand, A. Wagner,* ***A. Smekhova****, J. Fiedler, R. Böttger, C. Bähtz, K. Potzger*, "From a non-magnet to a ferromagnet: Mn+ implantation into different TiO2 structures", **Appl. Phys. Lett.**, 107, p.242405 (2015)
22. *A.S. Semisalova, Yu O. Mikhailovsky,* ***A. Smekhova****, A.F. Orlov, N.S. Perov, E.A. Gan'shina, A. Lashkul, E. Lähderanta, K. Potzger, O. Yildirim, B. Aronzon, A.B. Granovsky*, "Above room temperature ferromagnetism in Co- and V- doped TiO2-delta - revealing the different contributions of defects and impurities", **J. of Super. and Nov. Magn.**, 28, p.805–811 (2015)
23. *A.S. Semisalova, A. Orlov,* ***A. Smekhova****, E. Gan'shina, N. Perov, W. Anwand, K. Potzger, E. Lähderanta, and A. Granovsky*, "Above Room Temperature Ferromagnetism in Dilute Magnetic Oxide Semiconductors" in **Novel Functional Magnetic Materials**, **Springer Series in Materials Science** (A. Zhukov (ed.), 231, pp.187-219, Springer International Publishing Switzerland 2016
24. *F. Huttmann, D. Klar, N. Atodiresei, C. Schmitz-Antoniak,* ***A. Smekhova****, A.J. Martínez-Galera, V. Caciuc, G. Bihlmayer, S. Blügel, Th. Michely, and H. Wende*, "Magnetism in a Graphene - 4f - 3d Hybrid System", **ACS Nano**, to be submitted (2016)

Total number of publications: in journals – above 30; in proceedings – 10; abstracts – above 60; as a co-author in books – 1; as a co-author in textbooks – 2. Coordination of bilateral Russian-German projects as a PI (MSU - HZDR) - 1

**TEACHING EXPERIENCE:** Two years of teaching at Faculty of Physics (MSU) in the field of "practical" computer science; invited lectures about element-specific X-ray spectroscopies at the 1st Baltic School of Condensed Matter Physics and Magnetism (Kaliningrad, August 2012); thematic lectures about X-ray spectroscopies for the 2nd and 3rd year students at the Faculty of Physics (elective)