

## CURRICULUM VITAE – KRISTOF LEBECKI

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|-----------------------|-------------------------------------------|
| <b>Full name</b>      | Kristof Lebecki                           |
| <b>Date of Birth</b>  | 11 June 1967                              |
| <b>Nationality</b>    | Polish                                    |
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### Education

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|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2003-2008 | PhD in solid state physics, Polish Academy of Sciences, Poland.<br><i>Micromagnetic simulations in quasi one-dimensional ferromagnets: analysis of the influence of periodic boundary conditions.</i> Supervisor: Prof. Jacek Kossut. |
| 1985-1990 | MSc in solid state physics, University of Warsaw, Poland.<br><i>The influence of the Jahn-Teller effect on the magnetic properties of Fe-based semimagnetic semiconductors.</i> Supervisor: Dr Andrzej Twardowski.                    |

### Academic positions and work experience

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| 2009-2013 | Postdoc.<br>Physics Department of University of Konstanz (Group of Prof. Ulrich Nowak), Germany.                                                   |
| 1992-2003 | Worked for several companies (like Siemens, OBI, Citibank) on IT-related positions: programmer, administrator, presales support, analyst, manager. |
| 1991-1992 | Research assistant.<br>Institute for Microstructural Sciences of National Research Council (Group of Prof. Jan Dubowski), Ottawa, Canada.          |
| 1990-1991 | Research assistant.<br>Solid State Physics Section (Group of Prof. Jan Gaj), Institute of Experimental Physics, Warsaw University, Warsaw, Poland. |

## Major research and implementation achievements

- 1989-1992 and 2003-2004, *Warsaw University, NRC Canada, and Polish Academy of Sciences.*  
Written several experiment-supporting programs. Performed magneto-optical experiments, most of them in cryogenic conditions. Performed simple AFM measurements, simple MBE growth processes.
- 2005-2008, *Polish Academy of Sciences.*  
Shown importance of long-range dipolar interactions in micromagnetism (Lebecki, JPD 2008).  
Extended (by myself) the well-known OOMMF micromagnetic simulation platform (<http://math.nist.gov/oommf>) with a module implementing periodic boundary conditions.  
Extended the OOMMF with D-MOKE analysis. Applied it to arrays of interacting ferromagnetic triangles (Vavassori, PRB 2008).
- 2009-2013, *University of Konstanz.*  
Continued the research of one-dimensional periodic structures (Lebecki, PRB 2010).  
Analyzed ferromagnetic vortex behavior in the full temperature range (Lebecki, PRB 2012; Lebecki, JAP 2013). Extended the OOMMF with high-temperature module.  
Supervised several students.

## Scholarships, grants, prizes

- 2007-2008 Principal Investigator research grant no. 1344/B/H03/2007/33 granted by Ministry of Education and Science, Poland (self-prepared).
- 2007-2010 European agency COST Action P19 “Multiscale Modeling of Materials”,  
Member of working group WG3 “Multiscale Simulations: magnetic materials”.

## Collaboration with foreign centers

- Dr. Michael Donahue, NIST, Gaithersburg, USA.  
Subject: extension of the micromagnetic simulation package OOMMF.
- Prof. Oksana Chubykalo-Fesenko, ICMC, CSIC, Madrid, Spain.  
Subject: implementing temperature effects in micromagnetic simulations.
- Group of Prof. Hans Peter Oepen, Universität Hamburg, Germany.  
Subject: dipolar interaction between nanoelements (experiments).
- Prof. Dr. Paul Ziemann, PD Dr. Ulf Wiedwald, Universität Ulm, Germany.  
Subject: arrays of ferromagnetic antidots (experiments).
- Group of PD Dr. Mikhail Fonin, University of Konstanz, Germany.  
Subject: shape memory alloys, thin films (experiments).

### Selected most relevant publications

- Lebecki, K. M., M. J. Donahue, and M. W. Gutowski, *Periodic boundary conditions for demagnetization interactions in micromagnetic simulations*. J. Phys. D, 2008, **41**, 175005.
- Lebecki, K. M., M. J. Donahue, *Comment on “Frustrated magnetization in Co nanowires: Competition between crystal anisotropy and demagnetization energy”*. Phys. Rev. B, 2010, **82**, 096401.
- Lebecki, K.M., D. Hinzke, U. Nowak, and O. Chubykalo-Fesenko, *Key role of temperature in ferromagnetic Bloch point simulations*. Phys. Rev. B, 2012. **86**(9): p. 094409.

### Invited talks

- Faculty seminar, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, March 2013, *“Temperature effects in magnetism in the nanoscale”*.
- Faculty seminars “on Modern Trends in Physics Research”, Physics Faculty, Adam Mickiewicz University, Poznan, Poland, March 2013, *“Temperature effects in magnetism in the nanoscale”*.
- Tutorial “Micromagnetics”, Graduate School of Excellence “Materials Science in Mainz”, University of Mainz, Germany, September 2012, *“Principles of micromagnetic simulations”*.
- Faculty seminar, Institute of Physics, Polish Academy of Sciences, Warsaw, Poland, September 2012, *“Ferromagnetic simulations in the nanoscale”*.
- Seminar talk, Institute of Applied Physics, University of Hamburg, Germany, December 2010, *“Performing non-standard micromagnetic simulations”*.
- Seminar talk, Material Science Institute of Madrid, Spanish National Research Council, February 2010, *“Modeling of magnetic states in nanowires with transverse anisotropy”*.
- Popular science seminars during the “Physics day” event, University of Konstanz, Germany, from 2010 till 2012, *“Computer simulations—toward tomorrow's hard drive”*.
- Seminar talk, Department of Theoretical Physics, Budapest University of Technology and Economics, Hungary, November 2009, *“Micromagnetism—numerical simulations of periodic nanoobjects”*.
- Seminar talk, Department of Physics of Magnetism, University of Bialystok, Poland, September 2008, *“Periodic boundary conditions in micromagnetic simulations”*.

### Teaching experience

- Tutorials “Physics—basics” (semesters: 1, 2; 2008-2012), “Statistical mechanics” (semesters: 3 or 5; 2010-2011), “Computerphysics I” (semester: 4 or higher, 2011), University of Konstanz, Germany.
- Supervision of one Master Student (2011: Jonas Jelli) and Bachelor Students (2011: Jan Kloeckner, Andreas Wallucks), University of Konstanz, Germany.
- Entirely new lecture “Databases—basics” (ca. 8 semester; 2002-2006), Wyszynski University, Warsaw, Poland.

## List of publications

1. Lebecki, K.M. and U. Nowak, *Properties of magnetic vortices at elevated temperatures*. Journal of Applied Physics, 2013. **113**(2): p. 23906.
2. Jelli, J., K.M. Lebecki, S. Hankemeier, R. Frömter, H.P. Oepen, and U. Nowak, *Magnetic domain structure in coupled rectangular nanostructures*. IEEE Transactions on Magnetics, 2013. **49**(3): p. 1077.
3. Lebecki, K.M., D. Hinzke, U. Nowak, and O. Chubykalo-Fesenko, *Key role of temperature in ferromagnetic Bloch point simulations*. Physical Review B: Condensed Matter, 2012. **86**(9): p. 094409.
4. Balogh, L., K.M. Lebecki, B. Lazarovits, L. Udvardi, L. Szunyogh, and U. Nowak, *Monte Carlo study on magnetic nanoparticles from first principle*. Journal of Physics: Conference Series, 2010. **200**(7): p. 072103.
5. Lebecki, K.M. and M.J. Donahue, *Comment on "Frustrated magnetization in Co nanowires: Competition between crystal anisotropy and demagnetization energy"*. Physical Review B, 2010. **82**(9): p. 096401.
6. Lebecki, K.M., M.J. Donahue, and M.W. Gutowski, *Periodic boundary conditions for demagnetization interactions in micromagnetic simulations*. Journal of Physics D: Applied Physics, 2008. **41**: p. 175005.
7. Lebecki, K.M., O. Kazakova, and M.W. Gutowski, *Micromagnetic simulations of hysteresis in an array of cobalt nanotubes*. Physica B: Condensed Matter (Amsterdam), 2008. **403**(2-3): p. 360-363.
8. Vavassori, P., D. Bisero, V. Bonanni, A. Busato, M. Grimsditch, K.M. Lebecki, V. Metlushko, and B. Ilic, *Magnetostatic dipolar domain wall pinning in chains of Permalloy triangular rings micromagnets*. Physical Review B, 2008. **78**: p. 174403.
9. Lebecki, K.M., *Magnetization reversal modeling for long ferromagnetic nanotubes*. Materials Science-Poland, 2008. **26**(4).
10. Lebecki, K., Ł. Kłopotowski, and J. Kossut, *Optical Properties of a Semimagnetic Quantum Well in a Proximity of a Superconducting Film*. Acta Physica Polonica, A, 2005. **108**(5): p. 741.
11. Dubowski, J.J., K. Lebecki, and M. Buchanan, *Fiber optic CdMnTe magnetic field sensor made by the laser ablation deposition technique*. IEEE Transactions on Instrumentation and Measurements, 1994. **43**(2): p. 322.
12. Gaj, J.A., K. Nguyen The, M. Arciszewska, and K. Lebecki, *Temperature dependence of the energy gap in  $Cd_{1-x}Fe_xSe$* . Acta Physica Polonica, A, 1991. **80**(3): p. 405-7.
13. Gaj, J.A., K. Nguyen The, M. Nawrocki, A. Golnik, and K. Lebecki, *Scattering dynamics of free excitons on  $Fe^{++}$  ions in  $Cd_{1-x}Fe_xSe$* . Acta Physica Polonica, A, 1991. **80**(3): p. 409-12.
14. Lebecki, K. and A. Twardowski, *The role of Jahn-Teller effect on the magnetic properties of Fe-based semimagnetic semiconductors*. Solid State Communications, 1991. **80**(6): p. 377.
15. Lebecki, K., A. Twardowski, and Z. Liro, *The influence of Jahn-Teller effect on magnetic properties of Fe-based semimagnetic semiconductors*. Acta Physica Polonica, A, 1991. **79**(2-3): p. 373.