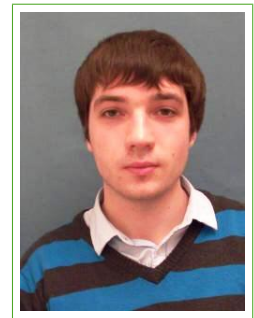



Alexey Kartsev

Curriculum Vitae

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Info

| | | | |
|---------------------------|---|-------------|---|
| Born | October, 20 1985; Bryansk, Russia | Citizenship | Russian |
| Additional Postal Address | Box 118, SE-221 00 Lund, Sweden | | |
| Additional e-mail | alexey@teorfys.lu.se | Skype | karec1 |
| Web page | http://matfys.lth.se/staff/Alexey.Kartsev | LinkedIn |  profile |

Education

- 2002-2008 **Master Degree in Condensed Matter Physics**, *National University of Science and Technology MISIS*, Moscow, Russia.
I have completed the 6 year program at the Theoretical Physics department at National University of Science and Technology. During last four years I had been focusing more on specialized areas. I received unique knowledge about real materials and physicochemical properties thereof. Supervisor Prof. Vekilov Yu. Kh. Co-supervisor Prof. E.I. Isaev.
- 2008-present **PhD in Theoretical Physics**, *Lund University*, Lund, Sweden.
I am finishing Postgraduate program at the Mathematical Physics Department at Lund University. My studies are focused on numerical methods and condensed matter simulations using Time Dependent Density Functional Theory calculations on a supercomputer clusters. The preliminary thesis defense date is march 2013. The research was carried out in collaboration with U.S. air force base Kirtland and Sandia National Laboratory. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA566596>
Supervisor Prof. Claudio Verdozzi. Co-supervisor Prof. Carl-Olof Almbladh.

Specialisation and current research interests

Solid State Physics
Electronic Theory of Solids
Lattice Dynamics
Density Functional Theory
Strongly Correlated Systems
Hubbard Model
UltraCold Atoms
Scientific Programming

Research Projects

- 2007-2008 *Ab initio* simulation of electronic, structural properties and lattice dynamics of magnetic metal mononitrides
- 2008-2009 Numerical solution of 1D Bethe-Ansatz equation for the new DFT *xc* potential in the Hubbard cluster
- 2009-2011 Numerical study of magnetic 1D Fermi gas in the optical lattice using TDDFT
- 2011 Transport through a single level quantum dot connected to semi-infinite leads
- 2010-2012 Expansion of trapped fermionic clouds in 3D optical lattice

Current Skills

During my master thesis research work I took first steps to the area of large-scale DFT calculations on supercomputers and also at that time I enhanced theoretical knowledge of DFT and its application to the solid state physics and the lattice dynamics calculations. Furthermore I gained large experience in computer science and numerical simulations, which includes operating systems, platforms, compilers and numerical methods.

During my PhD research I have written a computer code for Time Dependent DFT calculations for Hubbard Model in combination with DMFT calculations. The program consists of approximately 2000 lines in total with employment of efficient parallel and mathematical methods. I also developed a *xc* potential using numerical solution of 1D Bethe-Ansatz equation.

Throughout my career in academia I have been actively involved in writing of papers and scientific discussions.

Computer Skills

| | |
|----------------------------|---|
| Languages | Fortran, C, C++, HTML5, AWK, BASH, L ^A T _E X |
| Parallel Protocols | OpenMP, MPI |
| Science Libraries | Lapack, BLAS, ScaLapack, Mkl, NAG |
| Science Programs and Tools | Maple, Matlab, Mathematica, Xmgrace, Gnuplot |
| Other Platforms | Microsoft Office, OpenOffice, Adobe Acrobat Unix, Linux, Windows |

Languages

- Russian **Mother Tongue**, *Scientific Writing and Communication Skills.*
- English **Fluently**, *Scientific Writing and Public Speaking Skills.*
- Swedish **Elementary.**

Publications

- 1 E.I. Isaev, Yu.Kh. Vekilov, A.I. Kartsev, *Ab-initio investigation of electron and dynamical properties of heat-resistant materials*, Proc. of 61 scientific conference of students and young scientists of MISA (2006).
- 2 A.A. Artamonov, I.D. Bleskov, A.I. Kartsev, N.G. Bondarenko, E.I. Isaev, Yu.Kh. Vekilov, M.I. Katsnelson, *Lattice dynamics of B2 RuAl*, Proc. of the International Russian-Japan Symposium, 18-19 September, Saratov, Russia, pp. 843-849, 2007
- 3 Yu.Kh. Vekilov, E.I. Isaev, A.I. Kartsev, *Ab-initio investigation of electron, magnetic and dynamical properties of iron mononitride*, Proc. of 62 scientific conference of students and young scientists of MISA (2007).
- 4 Yu.Kh. Vekilov, E.I. Isaev, A.I. Kartsev, *Ab – initio investigation of lattice dynamic of new heat-resistant materials*, Proc. of 62 scientific conference of students and young scientists of MISA (2007).
- 5 E.I. Isaev, A.I. Kartsev, Yu.Kh. Vekilov, B. Johansson, I.A. Abrikosov, *Stability of Iron Mononitrides: First principles view of point*, in manuscript, 2007.
- 6 A.I. Kartsev, E.I. Isaev, Yu.Kh. Vekilov, I.A. Abrikosov, B. Johansson, *Magnetism of FeN from first principles*, Moscow International Symposium on Magnetism, June 20-25, Moscow, Russia, p. 524, 2008.
- 7 A.I. Kartsev, Yu.Kh. Vekilov, E.I. Isaev, I.A. Abrikosov and B. Johansson, *Stability of the face-centered-cubic phases of CoN under pressure*, Fifth International Alloy Conference (IAC-V), september 11-14 2008, Ruedgen, Germany.
- 8 V. Vettchinkina, A. Kartsev, D. Karlsson, C. Verdozzi, *Interacting fermions in 1D disordered lattices: Exploring localization and transport properties with lattice densityfunctional theories*, arXiv:1204.0672 submitted to Phys. Rev. B (2012).
- 9 A. Kartsev, D. Karlsson, A. Privitera and C. Verdozz, *Persistence of Mott plateaus in a 3d expansion of a confined Fermi gas into clean and disordered optical lattices*, submitted to Nature Physics
- 10 A. Kartsev, C. Verdozz, *Review: Lattice Density Functional Theory in 1D case*, in manuscript