

Oleksandr Marchukov

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Born: May 22, 1989—Kharkiv, Ukraine

Nationality: Ukrainian

Languages: Ukrainian, Russian - native speaker,
English - fluent, Danish - very good command

Research interests

Spin-orbit coupling in ultracold atomic gases

Few-body physics

One- and two-dimensional physical systems

Signatures of quantum chaos

Condensed matter physics

Quantum information

Education

09/2012-10/2015 PhD in Physics, Aarhus University. Main supervisor: Prof. Dmitri Fedorov
09/2010-02/2012 MSc in Theoretical Nuclear Physics, V.N. Karazin Kharkiv National University
09/2006-06/2010 BSc in Applied Physics, V.N. Karazin Kharkiv National University

Professional experience

04/2016- Seoul National University (Prof. Uwe Fischer), Postdoctoral Researcher
09/2015-01/2016 Aarhus University (Prof. Nikolaj Zinner), Research Assistant

List of publications

PHD THESIS

2015 Effects of Confinement on Conventional Spin Problems:

1. Spin-orbit Coupling in Two-Dimensional Systems
2. State Transfer in Spin Chains

JOURNAL ARTICLES

- 2013 **Marchukov O. V.**, Volosniev A. G., Fedorov D. V., Jensen A. S., Zinner N. T., "Spectral gaps of spin-orbit coupled particles in deformed traps", *J. Phys. B: At. Mol. Opt. Phys.*, 46, 134012
- 2014 **Marchukov O. V.**, Volosniev A. G., Fedorov D. V., Jensen A. S., Zinner N. T., "Statistical properties of spectra in harmonically trapped spin-orbit coupled systems", *J. Phys. B: At. Mol. Opt. Phys.*, 47, 195303
- 2015 **Marchukov O. V.**, Fedorov D. V., Jensen A. S., Volosniev A. G., Zinner N. T., "Repulsively interacting fermions in a two-dimensional deformed trap with spin-orbit coupling", *Eur. Phys. J. D*, 69, 3, 73
- 2016 **Marchukov O. V.**, Eriksen E. H., Midtgaard J. M., Kalaei A. A. S., Fedorov D. V., Jensen A. S., Zinner N. T., "Computation of local exchange coefficients in strongly interacting one-dimensional few-body systems: local density approximation and exact results", *Eur. Phys. J. D*, 70(2), 1-12

PREPRINTS

- 2016 Loft N. J. S., **Marchukov O. V.**, Petrosyan D., Zinner N. T., "Tunable self-assembled spin chains of strongly interacting cold atoms", submitted to *New. J. Phys.*
- 2016 **Marchukov O. V.**, Zinner N. T., Petrosyan D., Volosniev A. G., Valiente M., "Quantum transistor with a Heisenberg spin chain", to be submitted to *Nat. Phys.*

Teaching

Instructor Electrodynamics (Aarhus University)
Instructor Nuclear and Particle Physics (Aarhus University)
Instructor Advanced Mechanics (Aarhus University)

Conferences and Schools Attended

1. Summer School NewSpin3, Mainz, Germany, 2-9.04.2013
2. Workshop on Ultracold Atoms and Gauge Theories, Trieste, Italy, 13-17.05.2013
3. The 22nd European Conference on Few Body Problems in Physics, Kraków, Poland, 9-13.09.2013
4. Nordita Winter School 2014 in Condensed Matter Theory, Stockholm, Sweden, 06-17.01.2014
5. Computational Many-Body physics in the era of artificial gauge fields, Munich, Germany, 08-10.04.2015