Rockson Chang

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Physicist specializing in quantum, many-body systems of ultracold gases. Motivated by complex problems demanding technical yet creative solutions. Experienced with research-oriented programming in Python and Matlab for numerical simulation, user interfaces, data treatment and analysis. Strong project management and communication skills with 10 years of experience working in small-to-mid sized teams.

Personal details

Nationality: Canadian.

Date of Birth: July 10^{th}, 1982.

Education

2006-2013 **Doctor of Philosophy**.
Department of Physics, University of Toronto, Canada
Thesis: *Exploring matter-wave dynamics with a Bose-Einstein condensate*
Supervisor: Aephraim M. Steinberg

2005-2006 **Master of Science**.
Department of Physics, University of Toronto, Canada
Thesis: *An optical-dipole trap for experiments with Bose-Einstein condensates*
Supervisor: Aephraim M. Steinberg

2001-2005 **Bachelor of Engineering Science**.
Major in Engineering Physics with first class honours, Queen's University, Canada
4th year thesis: *Single-electron transistors*

Selected Research Experience

2013-present **Post-doctoral fellow**.
Atom Optics group, Laboratoire Charles Fabry, l'Institut d'Optique Graduate School, France
Researcher studying many-body correlations that arise in strongly-interacting ultracold gases.

2005-2013 **Research assistant**.
Department of Physics, University of Toronto, Canada
Experimental research studying matter-wave dynamics with Bose-Einstein condensates.

2005 **Research assistant**, *NSERC undergraduate research award*.
D-Wave Systems, Canada
Design of a cold-finger for mounting a prototype for a 4-qubit, superconducting quantum computer.

Refereed Publications

2016 R. Chang et al. *Momentum-resolved observation of quantum depletion in an interacting Bose gas*, In preparation. Pre-print: arXiv:1504.06197.

2015 F. Nogrette et al. *Characterization of a detector chain using a FPGA-based time-to-digital converter to reconstruct the three-dimensional coordinates of single particles at high flux*, Review of Scientific Instruments, **86**, 113105, 19 November 2015. Pre-print: arXiv:1504.06197.

2015 Q. Bouton et al. *Fast production of Bose-Einstein condensates of metastable helium*, Physical Review A, **91**, 061402(R), 9 June 2015. Pre-print: arXiv:1504.06197.

2014 R. Chang et al. *Three-dimensional laser cooling at the Doppler limit*, Physical Review A, **90**, 063407, 1 December 2014. Pre-print: arXiv:1409.2519v2. Selected as an *Editor's suggestion*.

2014 A. Hayat et al. *Enhanced coherence between condensates formed resonantly at different times*, Optics Express, **22**, pp. 30559-30570, 1 December 2014.

2014 R. Chang et al. *Observing the onset of effective mass*, Physical Review Letters, **112**, 170404, 2 May 2014. Pre-print: arXiv:1303.1139. See also Phys.org's feature story on the work.

2013 R. Chang et al. *Observation of transient momentum-space interference during scattering of a condensate from an optical barrier*, Physical Review A, **88**, 053634, 26 November 2013. Pre-print: arXiv:1303.1137.

Selected Awards

2012 Van Krandendonk teaching award, for teaching assistants at the University of Toronto.

2008 Ontario Centre for Excellence, travel award to CASTU Frontiers of Degenerate Gases in Beijing.

2007-2010 University of Toronto Fellowship, for Doctoral studies.

2005-2006 E. F. Burton Fellowship, for Master's studies.

2005 NSERC Industrial undergraduate research award with D-Wave Systems.

Selected Teaching Experience

2014-2015 **Lab demonstrator**, *Master 2 « Optique, Matière à Paris », Université Paris Sud.*
Tutorial and lab demonstration on an ultracold atoms experiment for Master students. Teaching in French.

2013 **Teaching Assistant**, *PHY335 - Quantum Mechanics for ECE, University of Toronto.*
Tutorial leader for introduction to quantum mechanics for electrical and computer engineering students.

2011-2012 **Teaching Assistant**, *PHY224/324 - Practical Physics, University of Toronto.*
Demonstrator for intermediate level-undergraduate labs for physics specialist students. Python based.

Computer competencies

Python: extensive numerical simulation, image treatment and analysis, development of GUIs with Tkinter, experience with iPython notebook.

Matlab: numerical simulation, image treatment and analysis, development of GUIs with *GUIDE*, extensive experience with data treatment and analysis, figure generation for scientific communication.

Additional programming languages: Maple, Labview, HTML

Technical design software: OSLO, SPICE, Solidworks

Office software: LaTeX, Microsoft Office Suite, Apache Open Office

Some of my projects can be found on GitHub (username: *rocksonchang*)

Languages

Native English speaker.

International French as a second language – professional working proficiency (ILR scale).

Personal Interests

Sports: Sports: Avid climber, with a love of both sport climbing and bouldering.

Currently reading: *The Looking Glass War*, John le Carré