

Dr. Joshua N. Milstein

Sloan-Swartz Fellow/Senior Postdoctoral Scholar

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Education

University of Colorado, Boulder -- Ph.D., Physics, 2004
Northern Illinois University -- M.S., Applied Physics, 1999
Northern Illinois University -- B.S., Psychology, 1996

Honors and Awards

2006 Sloan-Swartz Fellow in Theoretical Neuroscience
2004 Royal Society USA International Research Fellow
2004 National Science Foundation International Research Fellowship (Declined)
2003 National Science Foundation Dissertation Enhancement Award
1999 University of Colorado Graduate Fellowship

Professional Associations

Member, Division of Atomic, Molecular and Optical Physics, American Physical Society
Member, Institute of Physics

Research Experience

Senior Postdoctoral Scholar, Oct. 2006-present

Division of Biology, California Institute of Technology

Postdoctoral Research Fellow, Aug. 2004-Oct. 2006

Clarendon Laboratory, University of Oxford

Graduate Research Assistant, Aug. 2001-Aug. 2004

JILA, University of Colorado, Boulder

Visiting Graduate Researcher, Sept. 2003-Jan. 2004

Le Laboratoire Kestrel Brossel, École Normale Supérieure

Research Assistant, May 1998-Aug. 1999

Superconductivity and Magnetism Group, Argonne National Laboratory

Research Assistant, June 1997-May 1998

Fermi National Accelerator Laboratory, Batavia, Illinois

Teaching Experience

Instructor, Spring Term 2008

BIO 23, "Random Processes in Biology," Caltech

SURF Co-Mentor, Summer 2007

Supervisor for Ila Varma & Spencer Hughes, Caltech

Laboratory Demonstrator, 2005-2006

2nd/3rd Year Optics Practicals, University of Oxford

Tutor for physics and mathematics, 1999-2004

UC Student Academic Services Center (SASC), UC Boulder

Graduate Instructor, 1999-2000

ASTR 1010, Introduction to Astronomy, University of Colorado, Boulder
PHYS 1140/1150, Experimental Physics, University of Colorado, Boulder

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Graduate Instructor, 1996-1998

PHYS 250/251, Fundamentals of Physics I/II, Northern Illinois University

Pedagogy Training

Completed Richardson Level 1 Pedagogy Class, University of Oxford, 2005
Graduate Student Teacher Training Days, University of Colorado, Boulder, 1999

Other Professional Activities

Registered Scientific Contributor <http://www.scitalk.org.uk>

Conference organizer: "Oxbridge Meeting on Strongly-Correlated Phenomena in Cold Atoms," April 28, 2006, <http://www.physics.ox.ac.uk/Oxbridge2006>

Professional Talks and Presentations

Sloan-Swartz Annual Meeting, San Diego, California, US
CRCNS PI Meeting 2007, College Park, Maryland, US
NQS 2005, Camerino, Italy
Quantum Optics VI 2005, Krynica, Poland
EURESCO BEC 2003, San Feliu de Guixols, Spain
DAMOP 2003, Boulder, Colorado
ICAP 2002, Boston, Massachusetts
DAMOP 2002, Williamsburg, Virginia
APS March Meeting 1999, Atlanta, Georgia

Invited Talks

Lawrence-Berkeley National Laboratory, Berkeley, Ca., May. 2006

"Understanding mesoscopic superfluidity in atomic gases"

Technische Universiteit Eindhoven, Eindhoven, Netherlands, Jan. 2006

"Superfluidity and binary-correlations within clusters of fermions"

University of Cambridge, Cambridge, England, May 2005

"Grappling with superfluidity in cold atomic gases"

Univeristy of Trento, Trento, Italy, Dec. 2003

"The nature of resonance superfluidity"

École Normale Supérieure, Paris, France, Sept. 2003

"Pseudogap effects in the theory of resonance superfluidity"

University of Oxford, Clarendon Laboratory, Oxford, England, Jun. 2002

"Effective field theory of a Feshbach resonance in dilute atomic gases"

Condensed Matter Brown Bag Seminar, Boulder, Co., Mar. 2002

"A resonant crossover model for BEC to BCS superconductivity"

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Refereed Publications

"Neuronal Shot Noise and Brownian $1/f^2$ Behavior in the Local Field Potential"

J. N. Milstein and Christof Koch, (*in process, 2008*).

"Dynamic moment analysis of the extracellular electric field of a biologically realistic spiking neuron."

J. N. Milstein and Christof Koch, *Neural Comput.* **20**, 2070 (2008).

"A study of classical field techniques for condensates in one-dimensional rings at finite temperatures."

A. Nunnenkamp, J. N. Milstein, and K. Burnett, *Phys. Rev. A* **75**, 033604 (2007).

"Superfluidity and binary-correlations within clusters of fermions."

J. N. Milstein and K. Burnett, *J. Phys. B* **39**, 1965 (2006).

"Resonant formation of strongly correlated paired states in rotating Bose gases."

S.G. Bhongale, J. N. Milstein and M. Holland, *Phys. Rev. A* **69**, 053603 (2004).

"The nature of superfluidity near a Feshbach resonance."

Jelena Stajic, J.N. Milstein, Qijin Chen, M.J. Holland and K. Levin, *Phys. Rev. A* **69**, 063610 (2004).

"Feshbach resonances and collapsing Bose-Einstein condensates."

J.N. Milstein, C. Menotti and M. Holland, *N. J. Phys.* **5** (2003).

Quantum Gases Focus Issue.

"Resonance theory of the crossover from Bardeen-Cooper-Schrieffer superfluidity to Bose-Einstein condensation in a dilute Fermi gas."

J. N. Milstein, S. J. J. M. F. Kokkelmans and M. J. Holland, *Phys. Rev. A* **66**, 043604 (2002).

"Resonance superfluidity: Renormalization of resonance scattering theory."

S. J. J. M. F. Kokkelmans, J. N. Milstein, M. L. Chiofalo, R. Walser and M. J. Holland, *Phys. Rev. A* **65**, 053617 (2002).

"Signatures of resonance superfluidity in a quantum Fermi gas."

M. L. Chiofalo, S. J. J. M. F. Kokkelmans, J. N. Milstein and M. J. Holland, *Phys. Rev. Lett.* **88**, 090402 (2002).

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Other Publications

"From Cooper Pairs to Molecules: Effective field theories for ultra-cold atomic gases near Feshbach resonances."

Ph.D. thesis under the direction of Dr. Murray Holland.

"Fluctuation conductivity in the presence of columnar defects."

M.S. thesis under the direction of Dr. Valerii Vinokur and Dr. George Crabtree.

References

Professor Keith Burnett CBE FRS

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Dr. Christof Koch

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