

Curriculum Vitae for Woo-Joong Andy Kim

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RESEARCH INTERESTS	Static and dynamical Casimir effects, van der Waals interactions, surface contact force measurements using Electric Force Microscopy (EFM) and Atomic Force Microscopy (AFM), electrochemical synthesis of nanowires, quantized conductance in thin wires, and precision force measurements using a torsion balance and a fiber-optic interferometer.	
EDUCATION	Dartmouth College , Hanover, New Hampshire Ph.D., Physics, August 2007 <ul style="list-style-type: none">• Dissertation Topic: “Towards the experimental verification of macroscopic phenomena in quantum electrodynamics”• Advisors: Roberto Onofrio and James H. Brownell Middlebury College , Middlebury, Vermont B.A., Physics (Major), Chemistry and French (Minor), May 2002 <ul style="list-style-type: none">• Dissertation Topic: “Historical Survey: Concept of Energy and Conservation Laws”• Advisors: Jeffrey S. Dunham and Stephen Ratcliff	
PROFESSIONAL EXPERIENCES	<i>Assistant Professor of Physics</i> Dept. of Physics, Seattle University, Seattle, WA <i>Program Organizer</i> (with Prof. Udo Schwarz) Satellite workshop on the Casimir forces and their measurement, Aug 10-11, 2009 Yale University, New Haven, CT <i>Local Organizing Committee</i> 12th International Non-Contact AFM conference, Aug 11-14, 2009 Yale University, New Haven, CT <i>Postdoctoral Associate</i> (Advisor: Prof. Steve Lamoreaux) Dept. of Physics, Yale University, New Haven, CT <i>Short Term Visiting Scientist</i> Institut Laue-Langevin, Grenoble, France <i>Teaching and Research Assistant</i> Dept. of Physics and Astronomy, Dartmouth College, Hanover, NH <i>Technical Support and Training Coordinator</i> Center for Educational Technology, Middlebury, VT <i>Founder and Chief Editor</i> for International Magazine of The Stony Brook School The Stony Brook School, Stony Brook, NY	2009- present 2008 - 2009 2008 - 2009 2007 - 2009 2005 - 2006 2002 - 2007 1999 - 2001 1996 - 1998
HONORS AND AWARDS	Grants received for Casimir 2009 Workshop from ESF, 2009. European Science Foundation (ESF) short visit grant, 2008. Dartmouth Teaching Fellowships, 2002-2003, 2004-2007. Arts and Science Poster Session Award, Dartmouth College, 2006. The Gordon Hull Fellowship, Dartmouth College, 2003-2004.	

The Selamawit Tsehaye Teaching Award, Dartmouth College, 2003.

Charles A. Dana Scholar, Middlebury College, 1999.

MENTORING
ACTIVITY

Undergraduate senior thesis for B. A. in Physics

“Quantized conductance in gold nanowires” Charlie Milner, Class 09 of Yale University.

Undergraduate senior thesis for B. A. in Physics

“A Proposal to detect the dynamical Casimir effect based on absorption spectroscopy of lithium atoms,” Nathan Monnig, Class 05 of Dartmouth College.

Undergraduate project

“Experimental study of Casimir forces at finite temperature,” Scott Middleman, Class 06 of Dartmouth College.

TECHNICAL SKILLS

Experience with Scanning Electron Microscopy (SEM), Thermal Evaporator, Scanning Tunneling Microscopy (STM), and Atomic Force Microscopy (AFM)

External Cavity Diode Laser, fiber-optic components, and optical devices.

Ultra high vacuum systems: roughing, turbo, diffusion, and ion pumps.

Electronic circuits: feedback systems and phase-sensitive detectors

Matlab, Labview, Mathematica, and Igor.

PUBLICATIONS

1. W. J. Kim, U. D. Schwarz, “Potential contributions of noncontact atomic force microscopy for the future Casimir force measurements,” *J. Vac. Sci. Tech B* (accepted).
2. W. J. Kim, A. Sushkov, D. A. R. Dalvit, and S. K. Lamoreaux, “Measurement of the short-range attractive force between Ge plates using a torsion balance,” *Phys. Rev. Lett.* 103, 060401 (2009).
3. W. J. Kim, M. Brown-Hayes, J. H. Brownell, D. A. R. Dalvit, and R. Onofrio, “Reply to Comment on ‘Anomalies in the electrostatic calibrations for the measurement of the Casimir force in a sphere-plane geometry’”, *Phys. Rev. A* 79, 026102 (2009).
4. W. J. Kim, M. Brown-Hayes, J. H. Brownell, D. A. R. Dalvit, and R. Onofrio, “On electrostatic and Casimir force measurements between conducting surfaces in a sphere-plane configuration,” *J. Phys.: Conference Series* 162, 012004 (2009).
5. W. J. Kim, M. Brown-Hayes, J. H. Brownell, D. A. R. Dalvit, and R. Onofrio, “Anomalies in electrostatic calibrations for the measurement of the Casimir force in a sphere-plane geometry,” *Phys. Rev. A* 78, 020101(R) (2008).
6. J. H. Brownell, W.J. Kim, and R. Onofrio, “Modeling superradiant amplification of Casimir photons in very low dissipation cavities,” *J. Phys. A: Math. Gen.* 41, 164026 (2008).
7. W. J. Kim, M. Brown-Hayes, D.A.R. Dalvit, and R. Onofrio, “Status report on the measurement of the Casimir force in a cylinder-plane geometry”, in *Proceedings of the XLIIInd Rencontres de Moriond, Gravitational Waves and Experimental Gravity, La Thuile, Val d’Aoste, Italy, March 11-18, 2007*, edited by Jacques Dumarchez and Jean Tran Thahn Van, TheGioi Publishers (Vietnam, 2007), pp. 291-298.
8. M. Brown-Hayes, Q. Wei, W. J. Kim, and R. Onofrio, “Development of an apparatus for cooling ${}^6\text{Li} - {}^{87}\text{Rb}$ Fermi-Bose mixtures in a light-assisted magnetic trap,” *Laser Physics*, 17, 514 (2007).
9. W. J. Kim, J. H. Brownell, and R. Onofrio, “Comment on ‘A novel experimental approach for the detection of the dynamical Casimir effect’ by C. Braggio et al.,” *Euro. Phys. Lett.* 78, 21002 (2007).

10. W. J. Kim, J. H. Brownell, and R. Onofrio, "Detectability of dissipative motion in quantum vacuum via superradiance," *Phys. Rev. Lett.* 96, 200402 (2006). Featured in Physics Review Focus *Slowed by the vacuum*, May 2006; Research Highlights (Nature) *Feel the force*, June 2006; Sciencewatch (CERN Courier) *A way of detecting Casimir friction*, July 2006.
11. M. Brown-Hayes, J. H. Brownell, D. A. R. Dalvit, W. J. Kim, A. Lambrecht, F. C. Lombardo, F. D. Mazzitelli, S. M. Middleman, V. V. Nesvizhevsky, R. Onofrio, and S. Reynaud, "Thermal and dissipative effects in Casimir physics," *J. Phys. A: Math. Gen.* 39, 6195 (2006).
12. M. Brown-Hayes, D. A. R. Dalvit, F. D. Mazzitelli, W. J. Kim, and R. Onofrio, "Towards a precision measurement of the Casimir force in a cylinder-plane geometry," *Phys. Rev. A* 72, 052102 (2005).
13. W. J. Kim, S. Carr, and M. Wybourne, "Direct contact buckling of electrochemically grown gold nanowires," *Appl. Phys. Lett.* 87, 173112 (2005).

CONFERENCE AND
SEMINAR
PRESENTATIONS

1. "Precision measurement of the Casimir force using a torsion balance," University of Massachusetts-Amherst, Amherst, MA, Dec 9, 2008.
2. "Precision measurement of the Casimir force using a torsion balance," Ecole Normale Supérieure, Laboratoire Kastler Brossel, Paris, France Dec 1, 2008.
3. "Precision measurement of the Casimir force using a torsion balance," Institute for Microstructure Technology, Karlsruhe, Germany Nov 27, 2008.
4. "Precision measurement of the Casimir force using a torsion balance," The Theory and Practice of Fluctuation-Induced Interaction, Kavli Institute for Theoretical Physics, Santa Barbara, CA, Sept 16, 2008.
5. "Reports on the Casimir force measurements between Ge plates," Cambridge-Connecticut Open House, Harvard University, Cambridge, MA, Apr 11, 2008.
6. "Towards a precision measurement of the Casimir force between Ge plates using a torsion balance," Mechanical systems in quantum regime, Gordon Research Conference, Ventura, CA, Feb 17-22, 2008.
7. "Thermal and dissipative effects in Casimir physics," Middlebury College, Middlebury, VT, Apr 27, 2007.
8. "Thermal and dissipative effects in Casimir physics," Yale University, New Haven, CT, Apr 24, 2007.
9. "Exploring Casimir Effects in Quantum Vacuum: Is Vacuum Really Empty?" Colgate University, Hamilton, NY, Apr 10, 2007.
10. "Use of Film Bulk Acoustic Resonators (FBAR) to measure the dynamical Casimir effect," Samsung Advanced Institute of Technology (SAIT), Giheung, South Korea, Sept 15, 2006.
11. "Towards the experimental verification of the dynamical Casimir effect," Dept. of Physics, Seoul National University, Seoul, South Korea, Sept 14, 2006.
12. "Towards the experimental verification of the dynamical Casimir effect," Dept. of Physics, Korea Advanced Institute of Technology (KAIST), Daejeon, South Korea, Sept. 7, 2006.
13. "Nanoresonators in quantum vacuum," Nano Symposium, Dept. of Physics and Astronomy, Dartmouth College, Hanover, NH, June, 2006.
14. "Detectability of dissipative motion in quantum vacuum via superradiance," 2006 April Meeting of the Division of Atomic, Molecular, and Optical Physics, Knoxville, TN, May 16-20, 2006.

15. "Detection of the dynamical Casimir effect by ultrasensitive atomic spectroscopy," 2006 Dartmouth College Arts and Science Poster Session, Hanover, NH, April 24, 2006.
16. "Detection of the dynamical Casimir effect by ultrasensitive atomic spectroscopy," Workshops on Quantum Field Theory under the Influence of External Conditions (QFEXT05) Barcelona, Spain, Sept 5-9, 2005.
17. "Direct contact buckling of electrochemically grown gold nanowires," 2005 Dartmouth College Arts and Science Poster Session, Hanover, NH, April 7, 2005.
18. "Free-standing vertical gold nanowires from template synthesis," 2006 March Meeting of the American Physical Society, Los Angeles, CA, March 24, 2005.

LANGUAGES

English, French, and Korean