



UNIVERSITY SERVICE	<p>Seattle University</p> <p>Society of Physics Students Advisor, 2011–present.</p> <p>Curriculum Revision Committee, 2009–2011.</p> <p>Seattle University Academic Assembly, Fall 2011.</p> <p>Facilities Planning Committee, 2010–2011.</p>
GRANTS AND CONTRACTS	<p><i>Research at Undergraduate Institutions</i> (RUI) grant from the National Science Foundation. 2013–2016. <b>\$90,000.</b></p> <p>Research fund from <i>Clare Boothe Luce Research Program</i> (for mentoring Marie Pahlmeyer). 2012–2014. <b>\$6,000.</b></p> <p><i>Single-Investigator Cottrell College Science Award</i> (SI-CCSA) from the Research Corporation. 2011–2013. <b>\$35,000.</b></p> <p>Research fund from <i>M. J. Murdock Charitable Trust</i> (as part of startup package). 2009–2011. <b>\$25,000.</b></p> <p>Conference Grant for NC-AFM 2009. New Trends and Applications of the Casimir Effect from the European Science Foundation. 2009. <b>€2500.</b></p> <p>Research Travel Grant. New Trends and Applications of the Casimir Effect from the European Science Foundation. 2008. <b>€755.</b></p>
AWARDS AND FELLOWSHIPS	<p><i>Junior Faculty Professional Development Fellowship</i>, Seattle University, 2012.</p> <p><i>Arts and Science Best Poster Award</i>, Dartmouth College, 2006.</p> <p><i>The Gordon Hull Fellowship</i>, Dartmouth College, 2003–2004.</p> <p><i>The Selamawit Tsehaye Teaching Award</i>, Dartmouth College, 2003.</p> <p><i>Charles A. Dana Scholar</i>, Middlebury College, 1999.</p>
TEACHING ACTIVITIES	<p>Seattle University: <i>Assistant Professor of Physics</i> (2009-present)</p> <p><b>Introductory physics:</b> PHYS 107 (Thermodynamics, Optics, and Modern Physics), PHYS 122 (Electricity and Magnetism), and PHYS 123 (Waves and Optics).</p> <p><b>Intermediate physics:</b> PHYS 203 (Thermodynamics), PHYS 310 (Classical Mechanics), and PHYS 450 (Atomic Physics).</p> <p><b>Upper-level experimental physics:</b> PHYS 206 (Modern Physics Laboratory), PHYS 370 (Advanced Physics Laboratory), and PHYS 499 (Undergraduate Research).</p> <p>Dartmouth College: <i>Graduate Teaching Assistant</i> (2003-2006)</p> <p>PHYS 3 (General Physics I), PHYS 4 (General Physics II), PHYS 14 (Introductory Physics II), PHYS 19 (Introductory Physics III), PHYS 100 (Methods in Applied Mathematics), and PHYS 104 (Statistical Mechanics).</p>
MENTORING ACTIVITIES	<p><i>Undergraduate Research</i></p> <p><b>Valentin Raducan</b> (Physics), Seattle University: “ac-bridge circuit for a high-sensitivity torsion balance” (2013-present).</p>

**Sam Tuppen** (Physics), Seattle University: “Quantum point contact via electrochemical switching” (2012-present).

**Marie Pahlmeyer** (Physics and ME), Seattle University: “Precision capacitance microscopy” (2012-present).

**Andrew Hankins** (Physics), Seattle University: “Laboratory limit on the charge of photons by electric field deflection” (2011-2013).

**Charles Rackson** (Physics), Seattle University: “Development of an experimental apparatus to study quantized conductance” (2011-2013).

**Todd Graveson** (Physics), Seattle University: “Development of a high-sensitivity torsion balance” (2011-2013).

**Peter McDonnell** (Chemistry), Seattle University: “Electrochemical etching of tungsten wires” (2010-2012).

**Scott Middleman** (Physics), Dartmouth College: “Experimental study of Casimir forces at finite temperature” (2005-2006).

#### *Undergraduate Senior Thesis*

**Charlie Milner** (Physics), Yale University: “Quantized conductance in gold nanowires” (2008-2009).

**Nathan Monnig** (Physics), Dartmouth College: “A proposal to detect the dynamical Casimir effect based on absorption spectroscopy of lithium atoms” (2005-2006).

#### *Mentoring of High School Students*

**Alexander Anferov**, Roosevelt High School (Seattle, WA): “Electrostatic Calibrations of the Casimir force” (2011).

#### REFEREED PUBLICATIONS

1. A. Hankins, C. Rackson, and **W. J. Kim**, “Photon charge experiment,” *Am. J. Phys.* **81**, 436 (2013).
2. P. McDonnell, T. Graveson, C. Rackson, and **W. J. Kim**, “A detailed study of scaling behavior in electrochemical etching of tungsten wires: Effects of non-uniform etching,” *J. Phys. Chem. Solids* **74**, 30 (2013).
3. A. Sushkov, **W. J. Kim**, D. A. R. Dalvit, and S. K. Lamoreaux, “New experimental limits on non-Newtonian forces in the micrometer range,” *Phys. Rev. Lett.* **107**, 171101 (2011).
4. R. Ding, T. Baehr-Jones, **W. J. Kim**, B. Boyko, R. Bojko, A. Spott, A. Pomerene, C. Hill, W. Reinhardt, and M. Hochberg, “Low-loss asymmetric strip-loaded slot waveguides in silicon-on-insulator,” *Appl. Phys. Lett.* **98**, 233303 (2011).
5. R. Ding, T. Baehr-Jones, **W. J. Kim**, A. Spott, M. Fournier, J. M. Fedeli, S. Huang, J. Luo, A. K.-Y. Jen, L. Dalton, and M. Hochberg, “Sub-Volt Silicon-Organic Electro-optic Modulator with 500 MHz Bandwidth,” *Journal of Lightwave Technology* **29**, 1112 (2011).
6. A. Sushkov, **W. J. Kim**, D. A. R. Dalvit, and S. K. Lamoreaux, “Observation of thermal Casimir force,” *Nature Physics* **7**, 230 (2011).
7. R. Ding, T. Baehr-Jones, **W. J. Kim**, X. Xiong, R. Bojko, J. M. Fedeli, M. Fournier, and M. Hochberg, “Low-loss strip loaded slot waveguides in Silicon-on-Insulator,” *Optics Express* **18**, 25061 (2010).

8. **W. J. Kim**, A. Sushkov, D. A. R. Dalvit, and S. K. Lamoreaux, “Surface contact potential patches and Casimir force measurements,” *Phys. Rev. A* **81**, 022505 (2010).
9. **W. J. Kim** and U. D. Schwarz, “Potential contributions of noncontact atomic force microscopy for the future Casimir force measurements,” *J. Vac. Sci. Tech B* **28**, C4A1 (2010).
10. **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).
11. **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).
12. **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).
13. 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).
14. 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).
15. **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.,” *Europhys. Lett.* **78**, 21002 (2007).
16. **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.
17. 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).
18. **W. J. Kim**, S. Carr, and M. Wybourne, “Direct contact buckling of electrochemically grown gold nanowires,” *Appl. Phys. Lett.* **87**, 173112 (2005).

CONFERENCE  
PROCEEDINGS

1. T. Graveson, C. Rackson, and **W. J. Kim**, “Development of a high sensitivity torsion balance to investigate the thermal Casimir force,” *Int. J. Mod. Phys. A* **14**, 337 (2012).
2. **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).
3. **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.
4. 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).

For all publications, **h-index=11; total citations: 439** as of September 2013

INVITED  
SEMINARS

“Studying photons and electrons by table-top experiments,” Dept. of Physics, University of Washington, Seattle, WA, USA. Nov 26, 2012.

“Development of a high-sensitivity torsion balance to study the thermal Casimir force,” Dept. of Physics, University of California, Berkeley, CA, USA. May 18, 2012.

“Development of a high-sensitivity torsion balance to study the thermal Casimir force,” Dept. of Physics, University of Maryland, College Park, MD, USA. Feb 13, 2012.

“Quantum force in action: Casimir effects” The 7th Annual Young Generation and Technical Leadership Conference (YGTLC), Seattle, WA, USA. Jan 7-9, 2011.

“The Casimir force: How do we measure it using a torsion balance?” Korea Institute of Standards and Science, Daejeon, South Korea. Sept 8, 2010.

“Contact potential difference (CPD) in Casimir force measurements: How do we deal with it?” Dept. of Physics, University of Washington, Seattle, WA, USA. Nov 3, 2009.

“Precision measurements of the Casimir force using a torsion balance,” University of Massachusetts-Amherst, Amherst, MA, USA. Dec 9, 2008.

“Precision measurements of the Casimir force using a torsion balance,” Laboratoire Kastler Brossel, Ecole Normale Supérieure, Paris, France. Dec 1, 2008.

“Precision measurements of the Casimir force using a torsion balance,” Institute for Microstructure Technology, Karlsruhe, Germany. Nov 27, 2008.

“Precision measurements of the Casimir force using a torsion balance,” The Theory and Practice of Fluctuation-Induced Interaction, Kavli Institute for Theoretical Physics, Santa Barbara, CA, USA. Sept 16, 2008.

“Thermal and dissipative effects in Casimir physics,” Yale University, New Haven, CT, USA. Apr 24, 2007.

“Thermal and dissipative effects in Casimir physics,” Middlebury College, Middlebury, VT, USA. Apr 27, 2007.

“Detectability of dissipative motion in quantum vacuum via superradiance,” Samsung Advanced Institute of Technology (SAIT), Giheung, South Korea. Sept 15, 2006.

“Detectability of dissipative motion in quantum vacuum via superradiance,” Dept. of Physics, Korea Advanced Institute of Technology (KAIST), Daejeon, South Korea. Sept. 7, 2006.

“Detectability of dissipative motion in quantum vacuum via superradiance,” Dept. of Physics, Seoul National University, Seoul, South Korea. Sept 14, 2006.

CONTRIBUTED  
TALKS

“Development of a high-sensitivity torsion balance to study the thermal Casimir force,” The 11th Quantum Field Theory under the Influence of External Conditions (QFEXT11), Bensque, Spain. Sept 18–24, 2011.

“Development of a high-sensitivity torsion balance to study the Casimir/van der Waals interactions,” Northwest American Physical Society (NW-APS) Meeting, Walla Walla, WA, USA. Oct 1-2, 2010.

“Contact potential difference (CPD) in Casimir force measurements: How do we deal with it?” Satellite workshop of 12th International Non-Contact AFM conference: *Casimir forces and their measurements*, Yale University, New Haven, CT, USA. Aug 27, 2009.

“Precision measurements of the Casimir force using a torsion balance,” Cambridge-Connecticut Open House, Harvard University, Cambridge, MA, USA. Apr 11, 2008.

“Precision measurements of the Casimir force using a torsion balance,” Mechanical systems in quantum regime, Gordon Research Conference, Ventura, CA, USA. Feb 17-22, 2008.

“Detectability of dissipative motion in quantum vacuum via superradiance,” 2006 April Meeting of the Division of Atomic, Molecular, and Optical Physics, Knoxville, TN, USA. May 16-20, 2006.

“Detectability of the dynamical Casimir effect by ultrasensitive atomic spectroscopy,” The 8th Quantum Field Theory under the Influence of External Conditions (QFEXT05) Barcelona, Spain. Sept 5-9, 2005.

“Free-standing vertical gold nanowires from template synthesis,” 2005 March Meeting of the American Physical Society, Los Angeles, CA, USA. March 24, 2005.

CORE PROFESSIONAL  
OBJECTIVES

**In research:** To develop *simple* experiments that address *significant* problems in fundamental physics; to keep multi-disciplinary models (e.g. staying open to different techniques employed in other fields of physics and engineering) to tackle the problems at hand.

**In teaching:** To keep students *engaged* and *motivated*; to improve their learning effectiveness by adapting to each students’ challenges.