

Curriculum Vitae, Simen Andreas Ådnøy Ellingsen

August 2011

Personal details

Name: Simen Andreas Ådnøy Ellingsen
Date of Birth: 14th May 1981
Nationality: Norwegian
Marital status: Married to Inger Ådnøy Ellingsen, no children
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Education

- **2007 - 2010:** Ph.D., Dept. of Energy and Process Engineering, Norwegian University of Science and Technology (NTNU), Trondheim NO.
 - Thesis «Dispersion forces in Micromechanics» defended March 2011.
 - Supervisor Prof. Iver H. Brevik.
 - Opponents: Prof. Bo Sernelius and Prof. Finn Ravndal
- **2006 - 2009:** Ph.D., Department of War Studies, King's College London, UK.
 - Thesis «Nuclear Terrorism and Rational Choice» defended July 2009.
 - Supervisor Prof. Peter D. Zimmerman.
 - Studies financed by MacArthur scholarship.
 - Examiners: Dr. Charles D. Ferguson, Dr. Graham Spinardi
- **2001 - 2006:** Master of Science and Technology (M.Sc./Siv.ing.) of Technical Physics, NTNU, Trondheim NO. Masters thesis «Casimir Effect in Plane Parallel geometry» supervised by Prof. Iver H. Brevik.
- **1997 - 2000:** Tranberg Upper Secondary School, Gjøvik, NO. Graduation with school's best average grade of the year (5.89/6).

Positions: academic and teaching (selected)

- **From august 2011:** Post.doc./Researcher, Department of Energy and Process Engineering, NTNU, until 2013.
- **Spring 2006, 2008-2011:** Scientific Assistant of Teaching, Fluid Mechanics course, Department of Energy and Process Engineering. Includes marking of exams. The course has approximately 650 students each spring term.
- **2003-2006:** Head Teaching Assistant of subject Calculus 4K, four terms.
- **2002-2006:** Teaching Assistant in various courses in undergraduate mathematics and physics for six terms during the period.

Positions: other (selected)

- **Summers of 2005 and 2006:** Research Intern, the Norwegian Defence Research Establishment, Kjeller NO. Modelling and Simulation of radar systems.
- **Summer of 2005:** Intern for five weeks at the International Atomic Energy Agency (IAEA), Vienna AU, Physics department. Work on facilitating co-operation of nuclear research reactors in developing countries.

Fellowships, scholarships, prizes and grants

- **Prize:** The **Royal Norwegian Society of Sciences and Letters**, annual prize for 2011 to outstanding young researchers in Norway, financed by I.K. Lykke's fund. Two prizes are given annually, one for sciences, one for humanities.
- **Prize:** The **Exxon Mobil** annual prize 2011 for Ph.D. thesis at NTNU in the category of "basic research". Two prizes given annually to promovendi: basic and applied research.
- **Prize:** Best Junior Paper Award, QFEXT'09, Norman, Oklahoma US, September 2009, Shared with Dr. J. Munday of Harvard University. The bi-annual QFEXT conferences are the foremost meeting place for the Casimir effect research community.
- **2011-2013:** Post.doc. fellowship, Energy and Process Engineering, NTNU
- **2007-2011:** Ph.D. fellowship, IVT faculty, NTNU.
- **2006-2009:** Ph.D. scholarship from the MacArthur foundation.
- **Grants:** European Science Foundation, grant for academic visit within the activity CASIMIR. Two grants obtained, in 2009 and 2010, respectively.

Refereeing

- Served as referee for *Physical Review Letters* (6 times), *Physical Review A, D and E*, *Annals of Physics (N.Y.)*, *European Physical Journal Plus*, and *Progress in Electromagnetic Research (PIER)*.

Citations

According to *ISI Web of Science* 24.08.2011: 173 citations, 6.18 per publication (Citation data for 28 publications). h-index: 6.

Academic visits

- University of Oklahoma (Professor Kimball Milton's group), Norman, Oklahoma, 23.2-19.3 2008.
- Imperial College London (Dr. Stefan Scheel's group), 31.10-8.11 2008; 12.5-22.5 2009; 17.1-28.1 2010; 20.10-29.10 2010; 11.7-20.7 2011 + 2 shorter visits.
- Potsdam University, Germany (Dr. Carsten Henkel's group), 11.1-17.1 2009.
- Université Pierre et Marie Curie, Paris, France (Dr. Astrid Lambrecht & Dr. Serge Reynaud), 8.2-13.2 2010.

Research areas

Physics: quantum electrodynamics and optics

- Casimir effect in realistic systems
- Casimir-Polder forces out of thermal equilibrium
- Electrodynamics in media: Abraham-Minkowski problem

Physics: other

- Optical interaction with fluids and fluid interfaces
- Fluid dynamics

List of publications and talks

Simen Ådnøy Ellingsen (S.Å.E., formerly S.A.E)

TECHNICAL PUBLICATIONS

1. S.Å.E. and I. Brevik, "Electrostrictive fluid pressure from a laser beam" *Physics of Fluids* (accepted, in press 2011).
2. K.A. Milton, J. Wagner, P. Parashar, I. Cavero-Peláez, I. Brevik, and S.Å.E., "Multiple scattering: dispersion, temperature dependence, and annular pistons" *Cosmology, Quantum Vacuum and Zeta functions, Springer Proceedings in Physics* **137** edited by Odintsov et al. (Springer, 2011), pp. 99-113.
3. K.A. Milton, E.K. Abalo, P. Parashar, N. Pourtolami, I. Brevik, and S.Å.E., "Casimir-Polder repulsion near edges: wedge apex and a screen with an aperture" *Physical Review A* **83** 062507 (2011).
4. I. Brevik, S.Å.E., "Electromagnetic Momentum Conservation in Media" *Annals of Physics* **326** 754 (2011).
5. S.Å.E., S. Y. Buhmann, and S. Scheel "Casimir-Polder potential and transition rate in resonating cylindrical cavities ", *Physical Review A* **82** 032516 (2010).
6. F. Intravaia, S.Å.E., and C. Henkel "Casimir-Foucault interaction: Free energy and entropy at low temperature" *Physical Review A* **82** 032504 (2010).
7. J.A. Crosse, S.Å.E., C. Klements, S.Y. Buhmann, and S. Scheel "Thermal Casimir-Polder shifts in Rydberg atoms near metallic surfaces" *Physical Review A* (Rapid Communication), **82** 010901(R) (2010); Erratum *ibid.* **82** 029902(E) (2010).
8. I. Brevik and S.Å.E. "Possibility of measuring the Abraham force using whispering gallery modes", *Physical Review A* **81** 063830 (2010).
9. S.Å.E., S. Buhmann, S. Scheel "Temperature-independent Casimir-Polder forces despite large thermal photon numbers", *Physical Review Letters* **104** 223003 (2010).
10. S.Å.E., K.S. Gjerden, M. Grøva, and A. Hansen "Model for density waves in gravity-driven granular flow in narrow pipes", *Physical Review E* **81** 061302 (2010).
11. S.Å.E., Y. Sherkunov, S.Y. Buhmann, and S. Scheel "Casimir-Polder Potential in Thermal Non-Equilibrium", *Proceedings of QFEXT09, Norman, Oklahoma, September 2009* edited by M. Bordag and K.A. Milton (World Scientific, 2010), pp. 168-177, ArXiv: quant-ph/0910.5608.
12. I. Brevik, S.Å.E., and K.A. Milton "Electromagnetic Casimir Effect in Wedge Geometry and the Energy-Momentum Tensor in Media", *International Journal of Modern Physics A* **25** 2270 (2010).
13. S.Å.E., I. Brevik, and K.A. Milton "Casimir effect at nonzero temperature for wedges and cylinders", *Physical Review D* **81** 065031 (2010).
14. I. Brevik and S.Å.E. "Transverse radiation force in a tailored optical fiber", *Physical Review A* (Rapid Communication) **81** 011806(R) (2010).
15. S.Å.E., I. Brevik, and K. A. Milton "Electromagnetic Casimir Effect in a Medium-Filled Wedge II " *Physical Review E* **80** 021125 (2009).
16. S.Å.E., S. Y. Buhmann, and S. Scheel "Enhancement of thermal Casimir-Polder potentials of ground-state polar molecules in a planar cavity ", *Physical Review A* **80** 022901 (2009).
17. S.Å.E., S.Y. Buhmann, and S. Scheel "Dynamics of thermal Casimir-Polder forces on polar molecules " *Physical Review A* **79** 052903 (2009).

18. S.Å.E. "The Casimir frequency spectrum: can it be observed?", *Journal of Physics: Conference Series* **161** 012011 (2009).
19. S.Å.E., I. Brevik, J.S. Høye, and K.A. Milton "Low temperature Casimir-Lifshitz free energy and entropy: the case of poor conductors", *Journal of Physics: Conference Series* **161** 012010 (2009).
20. I. Brevik, S.Å.E., and K.A. Milton "Electromagnetic Casimir Effect in a Medium-Filled Wedge", *Physical Review E* **79** 041120 (2009).
21. I. Brevik and S.Å.E. "Comment on «Casimir Force Acting on Magnetodielectric Bodies Embedded in Media»", *Physical Review A* **79** 027801 (2009).
22. S.Å.E. "Casimir Lifshitz pressure and free energy: exploring a simple model" in *The Casimir Effect and Cosmology: A volume in honour of Professor Iver H. Brevik on the occasion of his 70th birthday* edited by S. Odintsov, E. Elizalde and O.G. Gorbunova (Tomsk State Pedagogical University Press, 2008) pp.45-60, **ArXiv:** quant-ph/0811.1427.
23. S.Å.E. "Nernst's heat theorem for Casimir-Lifshitz free energy", *Physical Review E* **78** 021120 (2008).
24. S.Å.E., I. Brevik, J.S. Høye, and K.A. Milton "Temperature correction to Casimir-Lifshitz free energy at low temperatures: semiconductors" *Physical Review E* **78** 021117 (2008).
25. S.Å.E. "Frequency spectrum of the Casimir force: interpretation and a paradox" *Europhysics Letters* **83** 053001 (2008).
26. I. Brevik, S.Å.E., J.S. Høye, and K.A. Milton "Analytical and numerical demonstration of how the Drude dispersive model satisfies Nernst's theorem for the Casimir entropy" *Journal of Physics A* **41** 164017 (2008).
27. J. S. Høye, I. Brevik, S.Å.E., and J.B. Aarseth "Analytic and Numerical Verification of the Nernst Theorem for Metals", *Physical Review E* **75** 051127 (2007).
28. S.Å.E., I. Brevik "Casimir force on real materials - the slab and cavity geometry" *Journal of Physics A* **40** 3643 (2007).
29. S.Å.E. "Casimir attraction in multilayered plane parallel magnetodielectric systems" *Journal of Physics A* **40** 1951 (2007).
30. I. Brevik, S.Å.E., and K.A. Milton "Thermal Corrections to the Casimir Effect" *New Journal of Physics* **8** 236 (2006).

SOCIAL SCIENCE PUBLICATIONS

- S.Å.E. "Deliberations of a Nuclear Terrorist: Patience or Opportunism" *Defense & Security Analysis* **26:4** 353 (2010)
- S.Å.E. "Safeguards against Nuclear Terrorism: HEU vs. Plutonium" *Defense & Security Analysis* **24:2** 129 (2008)

THESES

- S.Å.E. "Dispersion forces in Micromechanics: Casimir and Casimir-Polder forces affected by geometry and non-zero temperature", Thesis for the degree of Ph.D., Norwegian University of Science and Technology, Department of Energy and Process Engineering (March 2011).
- S.Å.E. "Nuclear Terrorism and Rational Choice", Thesis for the degree of Ph.D., King's College London, Department of War Studies (September 2009). Available for purchase through Lambert Academic Publishing (2011).

- S.A.E. "Casimir Effect in Plane Parallel Geometry", Master's Thesis
Norwegian University of Science and Technology, Trondheim, Norway (July 2006).

TALKS AND PRESENTATIONS

Conferences:

- "Frequency spectrum of the Casimir force: analysis and a paradox" *60 Years of Casimir Effect*, Brasilia, Brazil, June 23, 2008
- "Temperature corrections to the Casimir-Lifshitz force: poor conductors" *60 Years of Casimir Effect*, Brasilia, Brazil, June 23, 2008
- "Molecular guiding with thermal Casimir-Polder forces?" *QFEXT09*, University of Oklahoma, Norman, OK, USA, September 23, 2009
- "Casimir-Polder forces out of thermal equilibrium" *Fluctuation-Induced Forces in Condensed Matter*, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, October 15, 2010.

Other:

- "Casimir Effect between Poor Conductors: parallel plates", University of Oklahoma, Norman, OK, March 14 2008.
- "Casimir Effect: A force from Nothing?", Gløshaugen Akademiske Klubb, NTNU, Trondheim, October 23 2008.
- "Casimir Effect: the finite temperature problem", Theory seminar, Department of Physics, NTNU, Trondheim, October 30 2008.
- "Casimir-Polder forces out of thermal equilibrium" *Optics Workshop*, University of Tromsø, August 27 2010.
- "Dispersion forces in Micromechanics" Doctoral defence presentation, Norwegian University of Science and Technology, March 4 2011.
- "The Klein paradox and its experimental realisation in graphene" Doctoral trial lecture, Norwegian University of Science and Technology, March 4 2011.

PUBLIC OUTREACH

- Talk on the Casimir effect, to be given at Kunnskapsbyen, Trondheim, April 6 2011. Kunnskapsbyen is an arena for researchers to interact with the general public, a collaboration between NTNU and the Norwegian Royal Society of Sciences and Letters.
- Radio interview on Casimir forces for Norwegian National Radio P2, "Verd å Vite" popular science programme, aired October 26 2010.
- Two page feature article on the Casimir effect and my doctoral research for popular science magazine *Gemini*, distributed to Norwegian higher educational institutions and industry, approx. 100.000 copies.