Keith C. Schwab

ASSOCIATE PROFESSOR OF APPLIED PHYSICS

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Education

- Bachelor of Arts in Physics, University of Chicago, 1990.
- Ph.D. in Physics, University of California, Berkeley, 1996.
- Thesis topic: "Experiments with Superfluid Oscillators"
- Advisor: Prof. Richard Packard.

Employment and Appointments

- Associate Professor of Applied Physics, Caltech (1/2009-present).
- Associate Professor of Physics, Cornell University (4/2006 to 12/2008).
- Consultant with MITRE: current TS/SCI clearance.
- Senior Physicist, National Security Agency, 3/2000-4/2006, GS-15 rank.
- Adjunct Professor of Physics, University of Maryland, College Park, 2002-present.
- Visiting Professor at the University of New South Wales, Center for Quantum Computing Technology, January 2002.
- Affiliate member at NASA: Jet Propulsion Laboratory, 1997-2000.
- Sherman Fairchild Postdoctoral Scholar, California Institute of Technology, 1996-2000.

Research Interests

- Quantum effects in nano-mechanical and nano-electronic systems at ultra-low temperatures.
- Thermal transport and calorimetry at the nanoscale.
- Ultra-sensitive force detection with fully integrated cantilevers / detectors.
- Microdevices to bridge atomic and condensed matter physics experiments.
- Ultra-sensitive microwave measurement techniques.
- Superfluid helium gyroscopes and ultra-sensitive rotation sensors.

Awards and Honors

- Invited participant at the World Economic Forum, Annual Meeting in Davos, Switzerland, 2005, 2007, and 2008.
- Panelist for Fred Friendly Seminar on Nanotechnology, Security, and Privacy. Appeared nation-wide on PBS in spring of 2008.
- An image of a nanodevice created during our research has been accepted into the permanent collection at MoMA (New York) and was displayed during the exhibit "Design and the Elastic Mind," 2/2008-5/2008.
- Prize winner at the Young Scholars Competition at the "Amazing Light: Visions for Discovery" International Symposium, in tribute to Nobel Laureate Charles Townes, Berkeley, CA October 6-8, 2005.
- Selected as a member of the first class of the International Atomic Energy Agency's (IAEA) World Nuclear University, 2005 Summer Institute, an intensive program to study many aspects of nuclear technology (power, weapons, proliferation, waste.)
- Selected as a member of "The Forum of Young Global Leaders," a subgroup of the World Economic Forum (WEF), October 2004. (www.younggloballeaders.org)

- Named one of the "50 most influential men in America under 38 years old," by Details Magazine September 2003.
- Named one of the "10 most innovative in America under 40 years old," by Fortune Magazine September 2003.
- Named one of the "world's top 100 innovators in science and technology" by MIT's Technology and Review magazine, May 2002.
- Featured in an independent documentary film by Toni Sherwood, "The Uncertainty Principle: Making of an American Scientist," Lucid Films, 2000.
- Michelson Postdoctral Prize Lectureship for 2000, awarded by Case Western-Reserve.
- Awarded the Sherman Fairchild Prize Postdoctoral Fellowship at Caltech, 1996-2000.
- "Best Research Project" at the Fifth Undergraduate Summer Institute on Contemporary Topics in Applied Physics, Lawrence Livermore Laboratories, 1989.
- Eagle Scout, 1986.

I have published 47 peer reviewed papers with over 1700 citations, h-index = 19.

Given over 50 Invited Talks at International Conferences and Workshops

Given over 65 Colloquia and Seminars

Selected Publications

"Nanomechanical measurements of a superconducting qubit," M.D. LaHaye, J. Suh, P.M. Echternach, K.C. Schwab, M.L. Roukes , *Nature* **459,** (2009).

"Radio Frequency Scanning Tunneling Microscopy," U. Kemiktarak, T. Ndukum, K.C. Schwab, K.L. Ekinci, *Nature* ***450****, 85-89* (2007).

"Information on Cooling," K.C. Schwab, *Nature* **444**, 161-162 (2006). *News and Views.*

"Self-cooling of a micro-mirror by radiation pressure,", S. Gigan, H.R. Boehm, M. Paternostro, F. Blaser, G. Langer, J. Hertzberg, K. Schwab, D. Baeuerle, M. Aspelmeyer, A. Zeilinger, *Nature* **444**, 67-70 (2006).

"Quantum Measurement Backaction and Cooling Observed with a Nanomechanical Resonator," A. Naik, O. Buu, M.D. LaHaye, M.P. Blencowe, A.D. Armour, A. A. Clerk, K.C. Schwab, *Nature* **443**, 193 (2006.)

"Ion Trap in a Semiconductor Chip," D. Stick, W.K. Hensinger, M.J. Madsen, S. Olmschenk, K. Schwab, C. Monroe, cover article *Nature Physics* **1**, Jan. (2006.)

"Putting *Mechanics* into Quantum Mechanics," K.C. Schwab and M.L. Roukes, cover article *Physics Today* **58**, *36* (2005.)

"Approaching the Quantum Limit of a Nanomechanical Resonator," M. LaHaye, O. Buu, B. Camarota, K. Schwab, *Science* **304**, 74 (2004).

"Measurement of the Quantum of Thermal Conductance," K. Schwab, E.A. Henriksen, J.M. Worlock, and M.L. Roukes, *Nature* **404**, 974-977 (2000.)

"Detection of the Earth's Rotation Using Superfluid Phase Coherence," K. Schwab, N. Bruckner, and R. E. Packard", *Nature* **386**, pp. 585-587 (1997.)

"Faceted Crystal Growth in Two Dimensions," B. Berge, L. Faucheux, K. Schwab, A. Libchaber, *Nature* 350, p. 320 (1991).