

# Andrew Jayich

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## Education

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*Ph.D Physics, Yale University, New Haven, CT* 2012  
*A.B. Physics, Harvard University, Cambridge, MA* 2004

## Research Experience

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**Assistant Professor** 2016–present  
*University of California, Santa Barbara, Santa Barbara, CA*

**Postdoctoral Researcher** 2012–2016  
*University of California, Los Angeles, Los Angeles, CA*  
Demonstrated novel control techniques for atoms and molecules with optical frequency combs.

**Postdoctoral Researcher** 2011–2012  
*California Institute of Technology, Pasadena, CA*  
Worked on enhancing the quality factor of an optomechanical system with an optical spring.

**Graduate Student Researcher** 2005–2011  
*Yale University, New Haven, CT*  
Laser cooled an optomechanical system anchored to a  $^3\text{He}$  cryostat close to its quantum ground state.

**Undergraduate Student Researcher** 2001–2005  
*Harvard University, Cambridge, MA*

## Publications

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*Direct frequency comb laser cooling and trapping*

A.M. Jayich, X. Long, and W.C. Campbell

[Phys. Rev. X, 6, 41004 \(2016\)](#)

*Continuous all-optical deceleration and single-photon cooling of molecular beams*

A.M. Jayich, A.C. Vutha, M.T. Hummon, J.V. Porto, and W.C. Campbell

[Physical Review A, 89, 23425 \(2014\)](#)

*Cryogenic optomechanics with a  $\text{Si}_3\text{N}_4$  membrane and classical laser noise*  
A.M. Jayich, J.C. Sankey, K. Bjorke, D. Lee, C. Yang, M. Underwood, L. Childress, A. Petrenko,  
S.M. Girvin, and J.G.E. Harris  
[New Journal of Physics, 14, 115018 \(2012\)](#)

*Fiber-cavity-based optomechanical device*  
N.E. Flowers-Jacobs, S.W. Hoch, J.C. Sankey, A. Kashkanova, A.M. Jayich, C. Deutsch, J.  
Reichel, and J.G.E. Harris  
[Applied Physics Letters, 101, 221109 \(2012\)](#)

*Strong and Tunable Nonlinear Optomechanical Coupling in a Low-Loss System*  
J.C. Sankey, C. Yang, B.M. Zwickl, A.M. Jayich, and J.G.E. Harris  
[Nature Physics, 6, 707 \(2010\)](#)

*Dispersive optomechanics: a membrane inside a cavity*  
A.M. Jayich, J.C. Sankey, B.M. Zwickl, C. Yang, J.D. Thompson, S.M. Girvin, A.A. Clerk, F.  
Marquardt, and J.G.E. Harris  
[New Journal of Physics, 10, 95008 \(2008\)](#)

*High quality mechanical and optical properties of commercial silicon nitride membranes*  
B.M. Zwickl, W.E. Shanks, A.M. Jayich, C. Yang, A.C. Bleszynski Jayich, J.D. Thompson, and  
J.G.E. Harris  
[Applied Physics Letters, 92, 103125 \(2008\)](#)

*Strong dispersive coupling of a high-finesse cavity to a micromechanical membrane*  
J.D. Thompson, B.M. Zwickl, A.M. Jayich, F. Marquardt, S.M. Girvin, and J.G.E. Harris  
[Nature, 452, 6715 \(2008\)](#)

*Stable, mode-matched, medium-finesse optical cavity incorporating a micromechanical cantilever*  
J.G.E. Harris, B.M. Zwickl, and A.M. Jayich  
[Review of Scientific Instruments, 78, 13107 \(2007\)](#)

## Conference Proceedings

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*Improved "Position Squared" Readout Using Degenerate Cavity Modes*  
J.C. Sankey, A.M. Jayich, B.M. Zwickl, C. Yang, and J.G.E. Harris  
[Proceedings of the XXI International Conference on Atomic Physics, \(2009\)](#)  
edited by R. Cote, P.L. Gould, and M. Rozman, World Scientific, Singapore

*Linear optical properties of a high-finesse cavity dispersively coupled to a micromechanical membrane*  
J.G. E. Harris, A.M. Jayich, B.M. Zwickl, C. Yang, and J.C. Sankey  
[SPIE, 6907, \(2008\)](#)

## Talks

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*Direct frequency comb laser cooling and trapping*

**Invited Talk**, UCSD Condensed Matter Seminar, San Diego, CA, May 2017

*Frequency comb cooling for organic quantum chemistry*

**Invited Talk**, CAIQUE conference, Los Angeles, CA, September 2016

*Direct frequency comb laser cooling and trapping*

**Invited Talk**, UC Berkeley AMO seminar, Berkeley, CA, September 2016

*Direct frequency comb two-photon laser cooling and trapping*

Contributed Talk, DAMOP, Providence, RI, May 2016

*Direct frequency comb laser cooling and trapping*

**Invited Talk**, UCSB, Santa Barbara, CA, April 2016

*Laser cooling and trapping with optical frequency combs*

**Invited Talk**, DAMOP, Columbus, OH, June 2015

*Laser cooling and trapping with optical frequency combs*

**Invited Talk**, UCSB, Santa Barbara, CA, January 2015

*Continuous all-optical deceleration of molecular beams*

Contributed Talk, DAMOP, Madison, WI, June 2014

*Optomechanics with SiN membranes: Laser cooling starting with a 400 mK base temperature*

**Invited Talk**, Cal State Univeristy - Los Angeles Physics Colloquium, Los Angeles, CA, Oct. 2012

*Resolved Sideband Laser Cooling of a Cryogenic Micromechanical Membrane*

**Invited Talk**, USC, Los Angeles, CA, June 2011

*Resolved Sideband Laser Cooling of a Cryogenic Micromechanical Membrane*

**Invited Talk**, Caltech, Pasadena, CA, June 2011

*Resolved Sideband Laser Cooling of a Cryogenic Micromechanical Membrane*

**Invited Talk**, IBM Almaden Research Center, San Jose, CA, June 2011

*Resolved Sideband Laser Cooling of a Cryogenic Micromechanical Membrane*

**Invited Talk**, Stanford, Palo Alto, CA, June 2011

*Resolved Sideband Laser Cooling of a Cryogenic Micromechanical Membrane*

Contributed Talk, CLEO, Baltimore, MD, May 2011

*Optomechanics with a dispersive optomechanical system*

**Invited Talk**, École Normale Supérieure, Paris, France, Jan. 2009

*High quality optical and mechanical properties of a dispersive optomechanical device*

Contributed Talk, APS March Meeting, New Orleans, LA, March 2008

*Laser cooling of a microcantilever using a medium-finesse optical cavity*

Contributed Talk, APS March Meeting, Denver, CO, March 2007