

## KANG-KUEN NI

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Departments of Chemistry and Chemical Biology ◊ Harvard University

### EMPLOYMENT

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#### **Harvard University**

Assistant Professor  
Department of Chemistry and Chemical Biology  
Harvard-MIT Center for Ultracold Atoms

*Cambridge, MA  
July 2013 - Present*

#### **JILA**

National Research Council Postdoctoral Fellow  
Advisor: Prof. Eric Cornell

*Boulder, CO  
December 2011 - June 2013*

#### **California Institute of Technology**

Center for Physics of Information Postdoctoral Fellow  
Advisor: Prof. Jeff Kimble

*Pasadena, CA  
November 2009 - September 2011*

### EDUCATION

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#### **University of Colorado, Boulder**

Ph.D., Physics  
Thesis advisor: Prof. Deborah Jin  
JILA, the National Institute of Standards and Technology and the University of Colorado, Boulder  
*A quantum gas of polar molecules*

*August 2003 - December 2009*

#### **University of California, Santa Barbara**

B.S. with Highest Honors

*September 2000 - June 2003*

### AWARDS AND HONORS

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- Packard Fellowship for Science and Engineering, 2016
- Beckman Young Investigator Award, 2015
- Alfred P. Sloan Research Fellow in Physics, 2015
- AFOSR Young Investigator, 2015
- The International Organization of Chinese Physicists and Astronomers Outstanding Young Researcher Award (Macronix Prize), 2014
- National Research Council Postdoctoral Fellowship, NIST, 2011 - 2013
- American Physical Society Division of Atomic, Molecular, and Optical Physics (DAMOP) Thesis Prize, 2010
- Center for Physics of Information Postdoctoral Fellowship, Caltech, 2009 - 2011
- National Science Foundation Graduate Fellowship, 2004 - 2007
- University of California Leadership Excellence through Advanced Degrees scholar, 2001 - 2003

## PUBLICATIONS

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- [1] Y. Yu, N. R. Hutzler, J. T. Zhang, L. R. Liu, T. Rosenband, and K.-K. Ni. Motional Ground State Cooling Outside the Lamb-Dicke Regime. *ArXiv e-prints*, August 2017.
- [2] L. R. Liu, J. T. Zhang, Y. Yu, N. R. Hutzler, Y. Liu, T. Rosenband, and K.-K. Ni. Ultracold Molecular Assembly. *ArXiv:1701.03121*, January 2017.
- [3] Nicholas R Hutzler, Lee R Liu, Yichao Yu, and Kang-Kuen Ni. Eliminating light shifts for single atom trapping. *New Journal of Physics*, 19(2):023007, 2017.
- [4] William G. Tobias, Jason S. Rosenberg, Nicholas R. Hutzler, and Kang-Kuen Ni. A low-temperature external cavity diode laser for broad wavelength tuning. *Review of Scientific Instruments*, 87(11):113104, 2016.
- [5] K.-K. Ni, H. Loh, M. Grau, K. C. Cossel, J. Ye, and E. A. Cornell. State-specific detection of trapped  $\text{HfF}^+$  by photodissociation. *Journal of Molecular Spectroscopy*, 300:12–15, 2014.
- [6] H. Loh, K. C. Cossel, M. C. Grau, K.-K. Ni, E. R. Meyer, J. L. Bohn, J. Ye, and E. A. Cornell. Precision spectroscopy of polarized molecules in an ion trap. *Science*, 342(6163):1220–1222, 2013.
- [7] K.-K. Ni, R. Norte, D. J. Wilson, J. D. Hood, D. E. Chang, O. Painter, and H. J. Kimble. Enhancement of Mechanical Q Factors by Optical Trapping. *Physical Review Letters*, 108(21):214302, May 2012.
- [8] D. E. Chang, K.-K. Ni, O. Painter, and H. J. Kimble. Ultrahigh-Q mechanical oscillators through optical trapping. *New Journal of Physics*, 14(4):045002, April 2012.
- [9] Y. Zhao, D. J. Wilson, K.-K. Ni, and H. J. Kimble. Suppression of extraneous thermal noise in cavity optomechanics. *Optics Express*, 20:3586, February 2012.
- [10] D. Wang, B. Neyenhuis, M. H. G. de Miranda, K.-K. Ni, S. Ospelkaus, D. S. Jin, and J. Ye. Direct absorption imaging of ultracold polar molecules. *Physical Review A*, 81(6):061404, June 2010.
- [11] K.-K. Ni, S. Ospelkaus, D. Wang, G. Quémener, B. Neyenhuis, M. H. G. de Miranda, J. L. Bohn, J. Ye, and D. S. Jin. Dipolar collisions of polar molecules in the quantum regime. *Nature*, 464:1324–1328, April 2010.
- [12] S. Ospelkaus, K.-K. Ni, D. Wang, M. H. G. de Miranda, B. Neyenhuis, G. Quémener, P. S. Julienne, J. L. Bohn, D. S. Jin, and J. Ye. Quantum-State Controlled Chemical Reactions of Ultracold Potassium-Rubidium Molecules. *Science*, 327:853, February 2010.
- [13] S. Ospelkaus, K.-K. Ni, G. Quémener, B. Neyenhuis, D. Wang, M. H. G. de Miranda, J. L. Bohn, J. Ye, and D. S. Jin. Controlling the Hyperfine State of Rovibronic Ground-State Polar Molecules. *Physical Review Letters*, 104(3):030402, January 2010.
- [14] S. Ospelkaus, K.-K. Ni, M. H. G. de Miranda, B. Neyenhuis, D. Wang, S. Kotochigova, P. S. Julienne, D. S. Jin, and J. Ye. Ultracold polar molecules near quantum degeneracy. *Faraday Discussions*, 142:351, 2009.
- [15] K.-K. Ni, S. Ospelkaus, D. J. Nesbitt, J. Ye, and D. S. Jin. A dipolar gas of ultracold molecules. *Physical Chemistry Chemical Physics*, 11:9626, 2009.
- [16] K.-K. Ni, S. Ospelkaus, M. H. G. de Miranda, A. Pe’er, B. Neyenhuis, J. J. Zirbel, S. Kotochigova, P. S. Julienne, D. S. Jin, and J. Ye. A High Phase-Space-Density Gas of Polar Molecules. *Science*, 322:231, October 2008.
- [17] S. Ospelkaus, A. Pe’er, K. -K. Ni, J. J. Zirbel, B. Neyenhuis, S. Kotochigova, P. S. Julienne, J. Ye, and D. S. Jin. Efficient state transfer in an ultracold dense gas of heteronuclear molecules. *Nat. Phys.*, 4(8):622–626, 2008.

- [18] J. J. Zirbel, K.-K. Ni, S. Ospelkaus, T. L. Nicholson, M. L. Olsen, P. S. Julienne, C. E. Wieman, J. Ye, and D. S. Jin. Heteronuclear molecules in an optical dipole trap. *Physical Review A*, 78(1):013416, July 2008.
- [19] J. J. Zirbel, K.-K. Ni, S. Ospelkaus, J. P. D’Incao, C. E. Wieman, J. Ye, and D. S. Jin. Collisional Stability of Fermionic Feshbach Molecules. *Physical Review Letters*, 100(14):143201, April 2008.
- [20] D.K. Wood, K.K. Ni, D.R. Schmidt, and A.N. Cleland. Submicron giant magnetoresistive sensors for biological applications. *Sensors and Actuators A: Physical*, 120(1):1 – 6, 2005.

## INVITED TALKS

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WE-Heraeus-Seminar: Longrange interactions, Bad Honnef, Germany, October 25-27, 2017

DAMOP 2017, "Making a molecular gas in the quantum regime," Sacramento, CA, June 5-9, 2017

University of California, Berkeley, Atomic, Molecular, Optical physics seminar, "Ultracold Molecular Assembler", April 12, 2017

ACS National Meeting, Symposium on "Physical Chemistry meets AMO," "Ultracold Molecular Assembler", August 21, 2016

University of California, Los Angeles, Physical Chemistry seminar, "Molecules and reactions at micro-Kelvin temperature," April 11, 2016

University of Waterloo, Canada, Physics Colloquium, "Molecular physics and chemistry at micro-Kelvin temperature," April 21, 2016

Northwestern University, Atomic, Molecular, Optical physics seminar, "Ultracold Molecular Assembler", May 10, 2016

Amherst College, Physics Colloquium, "Molecular physics and chemistry at micro-Kelvin temperature," March 22 2016

International Organization of Chinese Physicists and Astronomers 8th Conference, "Precision Spectroscopy of Polarized Molecules in an Ion Trap, Singapore, June 2014

Cornell University, "New prospect for cold molecular physics," Ithaca, NY, April 4th, 2013

Duke University, "New prospect for cold molecular physics," March 6th, 2013

Columbia University, "New prospect for cold molecular physics," New York, NY, March 5th, 2013

Hong Kong University of Science and Technology, "New prospect for cold molecular physics," Hong Kong, February 28th.

University of Illinois at Urbana-Champaign, "New prospect for cold molecular physics", February 18, 2013

Harvard University, "New prospect for cold molecular chemistry and physics," Cambridge, MA, February 13, 2013

Joint Quantum Institute, "New prospect for cold molecular physics," College Park, MA, February 11, 2013

Cornell University, "New prospect for cold molecular physics," Ithaca, NY, February 5, 2013

Institute of Atomic and Molecular Sciences, "New prospect for cold molecular physics," Taipei, Taiwan, January 23, 2013

National Tsing Hua University, "New prospect for cold molecular physics," Hsinchu, Taiwan, January 21, 2013

Pennsylvania State University, "New prospect for cold molecular physics," State College, PA, January 15, 2013

Princeton University, "New prospect for cold molecular physics," Princeton, NJ, December 13, 2012

Institute for Advanced Study, Tsinghua University, Beijing, "Looking for electron out-of-roundness below  $10^{-28}$  centimeters", September 6, 2012

UC Berkeley AMO Seminar, "Optical Trapping of Dielectric Membranes," Berkeley, CA, April 13, 2011

DAMOP 2010, Thesis Prize Finalist presentation, Houston, TX, May 26, 2010

Quantum Optics Conference 2010, "Ultracold Collisions of Polar Molecules," Obergurgl, Austria, Feb., 2010

Center for Ultracold Atoms Seminar 2009, "Ultracold Collisions of Polar Molecules," Cambridge, MA, Nov. 17, 2009

DAMOP 2009, "Ultracold Molecules" session, Charlottesville, VA, May 22, 2009

Workshop on "Ultracold atoms and molecules", Hsinchu, Taiwan, March 28 and 29, 2009

Extreme Photonics, "Ultrafast meets Ultracold" Conference, Gamagori, Japan, Nov. 12, 2008