CURRICULUM VITAE

JOANNA M. ATKIN

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EDUCATION

10/2010-12/2014 **University of Colorado, Boulder**, Post-doctoral

Research advisor: Prof. Markus Raschke.

Department of Chemistry, Department of Physics, and JILA

Development of novel infrared and visible implementations of scattering-scanning near-field optical microscopy, for the study of strongly correlated electron and molecular systems.

5/2010 – 10/2010 **University of Washington, Seattle**, Post-doctoral

Research advisor: Prof. Markus Raschke.

Department of Chemistry

2003 – 2009 **Columbia University, New York**, Ph.D.

Department of Physics

Research advisor: Prof. Tony Heinz.
Dissertation: Optical spectroscopy and electrical characterization of low-*k* dielectric thin films.

2002 **Industrial Research Ltd, Lower Hutt,** New Zealand, Undergraduate research scholar (host: Dr. Shaun Hendy.)
Research: Growth of passivating oxide layers.

1999 – 2002 **Victoria University, Wellington**, New Zealand.
Undergraduate studies, B.S. (Hons) in Physics and Mathematics.
Undergraduate research: Modeling of nuclear magnetic quadrupole interactions in polymers (Supervisor: Prof. Paul Callaghan.)

PROFESSIONAL EXPERIENCE

2015-present **University of North Carolina- Chapel Hill**, Assistant Professor, Department of Chemistry.

AWARDS AND HONORS

Intel Foundation PhD Fellowship (2007-2009)
Allan M. Sachs Award for Teaching, Columbia University (2009)
New Zealand Federation of Graduate Women Fellowship (2005)
Victoria University Physics Honors Scholarship (2002)

PUBLICATIONS: REVIEWS AND BOOK CHAPTERS

1. M. B. Raschke, S. Berweger, and **J. M. Atkin**, "Ultrafast and nonlinear plasmon dynamics", *Plasmonics: Theory and Applications*, Ed. M. Stockman and T. Shahbazyan, Springer (2014).
2. **J. M. Atkin** and M. B. Raschke, "Optical Spectroscopy goes intramolecular", *Nature* **2013**, *498*, pp. 44-45.
3. **J. M. Atkin**, S. Berweger, A. C. Jones, and M. B. Raschke, "Nano-optical imaging and spectroscopy of order, phases, and domains in complex solids", *Adv. Phys.* **2012**, *61*, pp. 745-842.

PUBLICATIONS: ORIGINAL RESEARCH

Corresponding author:

1. E. T. Ritchie, D. J. Hill, J. F. Cahoon, and J. M. Atkin, "Characterization of Electrically-Active Doping Profile in Semiconducting Nanowires with Infrared Near-Field Optical Microscopy", *in preparation*.
2. J. M. Atkin, P. M. Sass, P. E. Teichen, J. D. Eaves, and M. B. Raschke, "Nanoscale probing of dynamics in local molecular environments", *J. Phys. Chem. Lett.* **2015**, *6*, pp. 4616-4621.
3. B. T. O'Callahan, , A. C. Jones, D. Cobden, and J. M. Atkin, M. B. Raschke, "Inhomogeneity of the ultrafast insulator-to-metal transition dynamics VO_2", *Nat. Comm.* **2015,** *6*, p. 6849.

Other UNC-CH:

4. T. McAfee, B. Hoffman, X. You, J. M. Atkin, H. Ade, and D. B. Dougherty, "Morphological, optical, and electronic consequences of coexisting crystal orientations in β-copper phthalocyanine thin films", *J. Phys. Chem. C,* **2016**, *120*, pp. 18616-18621.

Post-doctoral Research:

1. V. Kravtsov, R. Ulbricht, J. M. Atkin, and M. B. Raschke, "Plasmonic nano-focused four-wave mixing", *Nat. Nanotech.* **2016**, *11*, pp. 459-464.
    - Featured in News and Views, H. Petek, "Imaging: Nano meets Femto", *Nat. Nanotech.* **2016**, *11*, pp. 404-405.
2. K.-D. Park, V. Kravtsov, E. A. Muller, P. M. Sass, J. M. Atkin, and M. B. Raschke, "Variable-temperature tip-enhanced Raman spectroscopy of single-molecule fluctuations and dynamics", *Nano Lett.* **2015**, *16*, pp. 479-487.
3. D. M. Sagar, J. M. Atkin, P. K. B. Palomaki, N. R. Neale, J. L. Blackburn, J. C. Johnson, A. J. Nozik, M. B. Raschke, M. C. Beard, "Quantum confined electron-phonon interaction in silicon nanocrystals", *Nano Lett.* **2015,** *15*, pp. 1511-1516.

4. V. Kravtsov, S. Berweger, J. M. Atkin, and M. B. Raschke, "Control of plasmon emission and dynamics at the transition from classical to quantum coupling", *Nano Lett.* **2014,** *14*, pp. 5270-5275.
5. V. Kravtsov, J. M. Atkin, and M. B. Raschke, "Group delay and dispersion in adiabatic plasmonic nanofocusing", *Optics Letters* **2013**, *38*, pp. 1322-4.
6. S. Berweger, J. M. Atkin, R. L. Olmon, M. B. Raschke, "Light on the tip of a needle: Plasmonic nanofocusing for spectroscopy on the nanoscale", *J. Phys. Chem. Lett.* **2012**, *3*, pp. 945-952.
7. J. M. Atkin, S. Berweger, E. K. Chavez, M. B. Raschke, J. Cao, W. Fan, and J. Wu, "Strain and temperature dependence of the insulating phases of VO_2 near the metal-insulator transition", *Phys. Rev. B* **2012**, *85*, 020101.
8. S. Berweger*, J. M. Atkin*, X.G. Xu, R.L. Olmon, and M.B. Raschke, "Femtosecond Nano-Focusing with Full Optical Waveform Control", *Nano Lett.* **2011**, *11*, pp. 4309-4313.
9. S. Berweger, J. M. Atkin, R. L. Olmon, and M. B. Raschke, "Adiabatic Tip-Plasmon Focusing for Nano-Raman Spectroscopy", *J. Phys. Chem. Lett.* **2010**, *1*, pp. 3427–3432.

Ph.D. Research:

10. Z. Zhang, J. Atkin, M. Hopstaken, M. Hatzistergos, P. Ronsheim, E. Liniger, R. Laibowitz, and P. Solomon, "Probing the Interface Barriers of Dopant-Segregated Silicide–Si Diodes With Internal Photoemission", *IEEE Trans. Elect. Dev.* **2012,** *59*, pp. 2027-2032.
11. J. M. Atkin, E. Cartier, T. M. Shaw, J. R. Lloyd, R. B. Laibowitz, and T. F. Heinz, "The evolution of optical and electrical properties of low-k dielectrics under bias stress", *Micro. Eng.* **2009**, *86*, pp. 1891-1893.
12. J. M. Atkin, E. Cartier, T. Shaw, R. Laibowitz, and T. F. Heinz, "Charge trapping at the low-k dielectric-silicon interface probed by the conductance and capacitance techniques", *Appl. Phys. Lett.* **2008,** *93*, 122902.
13. J. M. Atkin, D. Song, T. M. Shaw, E. Cartier, R. B. Laibowitz and T. F. Heinz, "Photocurrent Spectroscopy of Low-k Dielectric Materials: Barrier Heights and Trap Densities", *J. Appl. Phys.* **2008,** *103*, 094104.

Undergraduate Research:

14. H. Deng, H. Nanjo, I. Ishikawa, N. J. Laycock, J. Atkin, and S. C. Hendy, "STM Observation of Grain Ripening during Air Exposure of the Passive Film Formed on Iron", *Electrochem. Solid-State Lett.* **2006**, *9*, B8.
15. J. Atkin, R. Cormier, P. Callaghan, "Time-dependence of nuclear magnetic resonance quadrupole interactions for polymers under shear", *J. Magnet. Resonance* **2005**, *172*, pp. 91-97.
16. A.N. Parbhu, J. Soltis, L.Q. Chen, J. Atkin and S.C. Hendy, "Specific Ion Binding Influences on the Surface Potential of Chromium Oxide", *Current Applied Physics* **2004**, *4*, pp. 152-155.

SELECTED PRESENTATIONS

1. Invited speaker: "Accessing chemically-specific information in complex materials with nanoscale optical spectroscopy", Society for Industrial Microbiology and Biotechnology, New Orleans (July 2016).
2. Invited speaker: "Near-field optical spectroscopy as a probe of nanoscale heterogeneity", Roger Miller Symposium, University of North Carolina, Chapel Hill (October 2015).
3. Invited speaker: "Nano-imaging and spectroscopy with optical antennas", SPIE Optics and Photonics, San Diego, CA (August 2015).
4. Invited speaker: "Optical antennas for nanoscale materials charaterization", NC A&T – Greensboro, NC (February 2015)

TEACHING ACTIVITIES

Fall 2015: Chemistry 486: Quantum Chemistry
Spring 2016: Chemistry 482: Physical Chemistry II
Fall 2016: Chemistry 481L: Physical Chemistry Laboratory I

PROFESSIONAL SERVICE

1. Co-organizer, Microscopy and Microanalysis Meeting (2015) in Portland, OR Symposium: "Fast and ultrafast imaging with electrons and photons".

2. Reviewer:

Journal Manuscripts for Physical Review Letters, Analytical Chemistry, Physical Review B, Optics Letters, Journal of Applied Physics, Nano Letters, ACS Nano.

Grant proposals: Ad hoc reviewer for NSF, AFOSR, DOE.

3. Department of Chemistry committee: Graduate recruiting committee: 2015-current.