

**Andrew M. Moran**  
**Curriculum Vitae**  
**August, 2013**

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**EDUCATION**

2002            Ph.D. Physical Chemistry, Kansas State University  
1999            B.S. Chemistry, University of Nebraska at Omaha

**PROFESSIONAL EXPERIENCE**

2013-            Associate Professor, University of North Carolina at Chapel Hill,  
Department of Chemistry  
2007- 2013      Assistant Professor, University of North Carolina at Chapel Hill,  
Department of Chemistry  
2004-2007      Postdoctoral Research Associate, University of Chicago, Department of  
Chemistry (Advisor: Norbert Scherer)  
2003-2004      Postdoctoral Research Associate, Northwestern University, Department  
of Chemistry (Advisor: Kenneth Spears)  
2002-2003      Postdoctoral Research Associate, University of Rochester (Advisor:  
Shaul Mukamel)  
1999-2002      Graduate Research Assistant, Kansas State University (Advisor: Anne  
Myers Kelley)

**HONORS AND MEMBERSHIPS**

*Honors and Awards*

2010-2015      NSF CAREER Award  
2007            R.J. Reynolds Junior Faculty Development Award  
2002            Outstanding Graduate Student Award, Kansas State University  
1999            Merit Fellowship Recipient, Kansas State University

*Professional Affiliations*

American Physical Society  
American Chemical Society

**REFEREED PUBLICATIONS**

**Refereed Papers at UNC Chapel Hill**

(49) B. A. West, B. P. Molesky, P. G. Giokas, A. M. Moran “Uncovering Molecular Relaxation Processes with Nonlinear Spectroscopies in the Deep UV”, *Chem. Phys.*, **423**, 92-104, (2013).

- **Perspective Article on Ultrafast Spectroscopy in Deep UV**

(48) E. M. Grumstrup, Z. Chen, R. P. Vary, A. M. Moran, K. S. Schanze, J. M. Papanikolas "Frequency Modulated Femtosecond Stimulated Raman Spectroscopy of Ultrafast Energy Transfer in a Donor-Acceptor Copolymer", *J. Phys. Chem. B*, **117**, 8245-8255, (2013).

(47) B. A. West, P. G. Giokas, B. P. Molesky, A. D. Ross, A. M. Moran "Toward two-dimensional photon echo spectroscopies with 200 nm laser pulses", *Opt. Express*, **21**, 2118-2125, (2013).

(46) P. G. Giokas, S. A. Miller, K. Hanson, M. R. Norris, C. R. K. Glasson, J. J. Concepcion, S. E. Bettis, T. J. Meyer, A. M. Moran "Spectroscopy and Dynamics of Phosphonate-Derivatized Ruthenium Complexes on TiO<sub>2</sub>", *J. Phys. Chem.*, **117**, 812-824, (2013).

(45) B. A. West, B. P. Molesky, N. P. Montoni, A. M. Moran "Nonlinear Optical Signatures of Ultraviolet Light-Induced Ring Opening in  $\alpha$ -Terpinene", *New. J. Phys.*, **15**, 025007 (2013).

- **Invited for Special Issue on Multi-Dimensional Laser Spectroscopy**

(44) B. A. West, A. M. Moran, "Two-Dimensional Spectroscopy in the Ultraviolet Wavelength Range", *J. Phys. Chem. Lett.*, **3**, 2575-2581, (2012).

- **Perspective Article on 2DUV Spectroscopy**

(43) B. A. West, J. M. Womick, A. M. Moran, "Interplay Between Vibrational Energy Transfer and Excited State Deactivation in DNA Components", *J. Phys. Chem. A.*, DOI:10.1021/jp306799e, (ASAP Online, 2012).

(42) J. M. Womick, B. A. West, N. F. Scherer, A. M. Moran, "Vibronic Effects in the Spectroscopy and Dynamics of C-Phycocyanin", *J. Phys. B: At. Mol. Opt. Phys.*, **45**, 154016, pp.1-12, (2012).

(41) B. A. West, J. M. Womick, A. M. Moran, "Influence of Temperature on Thymine-to-Solvent Vibrational Energy Transfer", *J. Chem. Phys.*, **135**, 114505, pp. 1-9, (2011).

- **2011 Editor's Choice in the Journal of Chemical Physics**

(40) B. A. West, J. M. Womick, A. M. Moran, "Probing Ultrafast Dynamics in Adenine with Mid-UV Four-Wave Mixing Spectroscopies", *J. Phys. Chem. A*, **115**, 8630-8637, (2011).

(39) S. A. Miller, B. A. West, A. C. Curtis, J. M. Papanikolas, A. M. Moran, "Uncovering Molecule-TiO<sub>2</sub> Interactions With Nonlinear Spectroscopy", *J. Chem. Phys.*, **135**, 081101, pp. 1-4, (2011).

- (38) J. W. Womick, H. Liu, A. M. Moran "Exciton Delocalization and Energy Transport Mechanisms in R-Phycoerythrin", *J. Phys. Chem. A*, **115**, 2471-2482, (2011).
- (37) B. C. Westlake, M. K. Brennaman, J. J. Concepcion, J. J. Paul, S. E. Bettis, S. D. Hampton, S. A. Miller, N. V. Lebedeva, M. D. E. Forbes, A. M. Moran, T. J. Meyer, J. M. Papanikolas, "Concerted Electron-Proton Transfer in the Optical Excitation of Hydrogen-Bonded Dyes", *Proc. Natl. Acad. Sci.*, **108**, 8554-8558, (2011).
- (36) B. A. West, J. M. Womick, L. E. McNeil, A. M. Moran "Influence of Vibronic Coupling on Band Structure and Exciton Self-Trapping in  $\alpha$ -Perylene", *J. Phys. Chem. B*, **115**, 2371-2380, (2011).
- (35) S. A. Miller, A. C. Stuart, J. M. Womick, H. Zhou, W. You, A. M. Moran "Excited-State Photophysics in a Low Band Gap Polymer with High Photovoltaic Efficiency" *J. Phys. Chem. C*, **115**, 2371-2380, (2011).
- (34) J. W. Womick, A. M. Moran "Vibronic Enhancement of Exciton Sizes and Energy Transport in Photosynthetic Complexes", *J. Phys. Chem. B*, **115**, 1347-1356, (2011).
- (33) B. A. West, J. M. Womick, L. E. McNeil, A. M. Moran "Ultrafast Dynamics of Frenkel Excitons in Tetracene and Rubrene Single Crystals", *J. Phys. Chem. C*, **114**, 10580-10591, (2010).
- (32) J. W. Womick, S. A. Miller, A. M. Moran "Toward the Origin of Exciton Electronic Structure in Phycobiliproteins", *J. Chem. Phys.*, **130**, 024507, pp. 1-10, (2010).
- (31) S. A. Miller, C. A. Fields-Zinna, R. W. Murray, A. M. Moran "Nonlinear Optical Signatures of Core and Surface Electronic States in  $\text{Au}_{24}\text{PdL}_{18}$ ", *J. Phys. Chem. Lett.* **1**, 1383-1387, (2010).
- (30) S. A. Miller, A. M. Moran "Nonlinear Optical Detection of Electron Transfer Adiabaticity in Metal Polypyridyl Complexes", *J. Phys. Chem. A*, **114**, 2117-2126, (2010).
- (29) J. W. Womick, A. M. Moran "Nature of Excited States and Relaxation Mechanisms in C-Phycocyanin", *J. Phys. Chem. B*, **113**, 15771-15782, (2009).
- (28) J. W. Womick, A. M. Moran "Exciton Coherence and Energy Transport in the Light-Harvesting Dimers of Allophycocyanin", *J. Phys. Chem. B*, **113**, 15747-15759, (2009).
- (27) J. W. Womick, S. A. Miller, A. M. Moran "Correlated Exciton Fluctuations in Cylindrical Molecular Aggregates", *J. Phys. Chem. B*, **113**, 6630-6639, (2009).

(26) J. W. Womick, S. A. Miller, A. M. Moran “Probing the Dynamics of Intraband Electronic Coherences in Cylindrical Molecular Aggregates”, *J. Phys. Chem. A*, **113**, 6587-6598, (2009).

(25) S. A. Miller, J. W. Womick, J. F. Parker, R. W. Murray, A. M. Moran “Femtosecond Relaxation Dynamics of Au<sub>25</sub>L<sub>18</sub>- Monolayer-Protected Clusters”, *J. Phys. Chem. C*, **113**, 9440-9444, (2009).

### ***Postdoctoral Research***

(24) M. A. Hershberger, A. M. Moran, N. F. Scherer, "New Insights into Response Functions of Liquids by Electric Field-Resolved Polarization Emission Time Measurements", *J. Phys. Chem. B*, **115**, 5617-5624, (2011).

(23) S. Park, J. Kim, A. M. Moran, N. F. Scherer "Solvent structural relaxation dynamics in dipolar solvation studied by resonant pump polarizability response spectroscopy", *Phys. Chem. Chem. Phys.*, **13**, 214-223 (2011).

(22) J. A. Gruetzmacher, R. A. Nome, A. M. Moran, N. F. Scherer “Assessing the dephasing dynamics of water from linear field-resolved pulse propagation experiments and simulations in highly absorbing solutions” *J. Chem. Phys.*, **129**, 224502, pp.: 1-10, (2007).

(21) A. M. Moran, S. Park, N. F. Scherer “Polarizability response spectroscopy: Formalism and simulation of ultrafast dynamics in solvation”, *Chem. Phys.*, **341**, 344-356, (2007).

(20) A. M. Moran, R.A. Nome, N. F. Scherer “Field-resolved measurement of reaction-induced spectral densities by polarizability response spectroscopy”, *J. Chem. Phys.*, **127**, 184505, pp. 1-13, (2007).

(19) A. M. Moran, R. A. Nome, N. F. Scherer “Field-resolved coherent raman spectroscopy of high-frequency vibrational resonances”, *J. Phys. Chem A*, **110**, 10925-10928 (2006).

(18) A. M. Moran, R. A. Nome, N. F. Scherer “Resolving solute and solvent emission times by spectral interferometry”, *J. Chem. Phys.*, **125**, 031101, pp. 1-4, (2006).

(17) A. M. Moran, S. Park, N. F. Scherer “Coherent electronic and nuclear dynamics for charge transfer in 1-ethyl-(carbomethoxy)pyridinium iodide”, *J. Phys. Chem B*, **110**, 19771-19783 (2006).

(16) A. M. Moran, J. B. Maddox, J. W. Hong, J. Kim, R. A. Nome, G. C. Bazan, S. Mukamel, N. F. Scherer “Optical coherence and theoretical study of the excitation dynamics of a highly symmetric cyclophane-linked oligophenylenevinylene dimer”, *J. Chem. Phys.*, **124**, 194904, 1-15, (2006).

- (15) A. M. Moran, J. Sung, E. McLellan, R.P. Van Duyne, K.G. Spears "Second harmonic excitation spectroscopy of silver nanoparticle arrays", *J. Phys. Chem. B*, **109**, 4501-4506 (2005).
- (14) A. M. Moran, P. Aravindan, and K.G. Spears "Solvent adiabaticity effects on ultrafast electron transfer in viologen charge transfer complexes", *J. Phys. Chem A*, **109**, 1795-1801 (2005).
- (13) A. M. Moran and S. Mukamel "The origin of vibrational mode couplings in various secondary structural motifs of polypeptides", *Proc. Natl. Acad. Sci.*, **101**, 506-510 (2004).
- (12) A.M. Moran and K. G. Spears "The effect of diffusive solvent relaxation on ultrafast electron transfer within the methyl viologen-hexacyanoferrate complex in trehalose-water glass", *Chem. Phys. Lett.*, **393**, 397-402 (2004).
- (11) J. Dreyer, A. M. Moran and S. Mukamel "Coherent three-pulse spectroscopy of coupled vibrations in a rigid dipeptide: DFT simulations", *J. Phys. Chem. B*, **107**, 5967-5985 (2003).
- (10) A. M. Moran, S. -M. Park, J. Dreyer and S. Mukamel "Linear and nonlinear IR signatures of local  $\alpha$ - and  $3_{10}$ -helical structures in alanine polypeptides", *J. Chem. Phys.* **118**, 3651-3659 (2003).
- (9) A. M. Moran, S.-M. Park, and S. Mukamel "Infrared photon echo signatures of hydrogen bond connectivity in the cyclic decapeptide antamanide", *J. Chem. Phys.* **118**, 9971-9980 (2003).
- (8) J. Dreyer, A. M. Moran and S. Mukamel "Tensor components in three-pulse vibrational echoes of a rigid dipeptide ", *Bull Kor. Chem. Soc.* **24**, 1091-1096 (2003).
- (7) A. M. Moran, J. Dreyer and S. Mukamel "Ab initio simulation of the two-dimensional vibrational spectrum of dicarbonylacetylacetonato rhodium(I)", *J. Chem. Phys.* **118**, 1347-1355 (2002).

### ***Research as Graduate Student***

- (6) A. M. Moran, A. M. Kelley, and S. Tretiak. "Excited state molecular dynamics simulations of nonlinear push-pull chromophores", *Chem. Phys. Lett.*, **367**, 293-307 (2003).
- (5) A. M. Moran, M. Blanchard-Desce, and A. M. Kelley. "Aromatic versus polyenic linkers in push-pull chromophores: Electron-phonon coupling effects", *Chem. Phys. Lett.*, **358**, 320-327 (2002).

(4) A. M. Moran, G. P. Bartholomew, G. C. Bazan, and A. M. Kelley. "Effects of a paracyclophane linker on the charge transfer transition of 4-dimethylamino-4'-nitrostilbene", *J. Phys. Chem. A*, **106**, 4928-4937 (2002).

(3) A. M. Moran, D. S. Egolf, M. Blanchard-Desce, and A. M. Kelley. "Vibronic effects on solvent dependent linear and nonlinear optical properties of push-pull chromophores: julolidinemalononitrile", *J. Chem. Phys.*, **116**, 2542-2555 (2002).

(2) A. M. Moran, C. Delbecque, and A. M. Kelley. "Solvent effects on ground and excited electronic state structures of the push-pull chromophore julolidinyl-*n*-N,N'-diethylthiobarbituric acid." *J. Phys. Chem. A* **105**, 10208-10219 (2001).

(1) A. M. Moran and A. M. Kelley. "Solvent effects on ground and excited electronic state structures of *p*-nitroaniline." *J. Chem. Phys.* **115**, 912-924 (2001).

### **Meeting Proceedings**

#### ***Research at UNC-Chapel Hill***

(4) B. A. West, J. M. Womick, A. M. Moran, "Probing Vibrational Energy Transfer in DNA Nucleobases with Mid-UV Four-Wave Mixing Spectroscopies", in *Laser Science*, OSA Technical Digest, paper LMB4, (2011).

(3) B. A. West, J. M. Womick, L. E. McNeil, K. J. Tan, A. M. Moran, "Intermolecular Correlation Effects in the Electronic Relaxation Dynamics of Organic Single Crystals", *Ultrafast Phenomena XVII*, Oxford University Press, 173-175, (2011).

(2) S. A. Miller, C. A. Fields-Zinna, R. W. Murray, A. M. Moran, "Femtosecond Relaxation Dynamics of Core and Surface Localized Electronic States in Au<sub>24</sub>PdL<sub>18</sub>", *Ultrafast Phenomena XVII*, Oxford University Press, 323-325, (2011).

#### ***Postdoctoral Research***

(1) A. M. Moran, J. B. Maddox, J. W. Hong, J. Kim, R. A. Nome, G. C. Bazan, S. Mukamel, N. F. Scherer, "Two-Color Electric Field Resolved Transient Grating Spectroscopy of an Oligophenylenevinylene Dimer", *Ultrafast Phenomena XVII*, Oxford University Press, 243-245, (2007).

### **SEMINARS AND PAPERS PRESENTED**

#### **a. Invited Presentations**

- |     |   |                 |
|-----|---|-----------------|
| (5) | Physics of Quantum Electronics, Snowbird, UT  | January 9, 2013 |
| (4) | "Structure and Dynamics of Complex Macromolecular Systems of Biological and Synthetic Origin" Telluride, CO | July 4, 2012    |
| (3) | Black Forest Focus on Soft Matter 7: "Multidimensional  | March 14, 2012  |

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|-----|--|-----------------|
|     | Optical Spectroscopy and Imaging: Temporal and spatial resolution at the cutting edge", (Near) Freiburg, Germany |                 |
| (2) | Fifth International Conference on Coherent Multidimensional Spectroscopy, Minneapolis, MN                        | August 19, 2010 |
| (1) | Workshop on Quantum Effects in Biological Systems, Cambridge, MA   | June 18, 2010   |

**b. Departmental Seminars**

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|------|---|--------------------|
| (18) | University of Michigan                                | February 21, 2013  |
| (17) | University of South Carolina                          | November 12, 2012  |
| (16) | Duke University                                       | November 6, 2012   |
| (15) | University of Georgia (Physics)                       | October 18, 2012   |
| (14) | University of Rochester                               | April 9, 2012      |
| (13) | Pennsylvania State University                         | April 6, 2012      |
| (12) | Massachusetts Institute of Technology                 | March 6, 2012      |
| (11) | University of Chicago                                 | December 13, 2011  |
| (10) | State University of New York at Stony Brook (Physics) | December 5, 2011   |
| (9)  | University of Minnesota                               | November 22, 2011  |
| (8)  | University of California at Irvine                    | November 1, 2011   |
| (7)  | University of California at Riverside                 | October 31, 2011   |
| (6)  | Kansas State University                               | October 5, 2011    |
| (5)  | Michigan State University                             | September 29, 2011 |
| (4)  | Wayne State University                                | September 28, 2011 |
| (3)  | University of Colorado                                | February 4, 2011   |
| (2)  | University of Oregon                                  | January 24, 2011   |
| (1)  | University of Toronto                                 | November 4, 2008   |

**c. Other Presentations**

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|-----|---|-------------------|
| (8) | National Meeting of American Physical Society, Boston, MA             | February 28, 2012 |
| (7) | Optical Society of America, Laser Science Conference, San Jose, CA    | October 16, 2011  |
| (6) | National Meeting of American Chemical Society, Denver, CO             | August 28, 2011   |
| (5) | National Meeting of American Physical Society, Dallas, TX             | March 21, 2011    |
| (4) | National Meeting of American Physical Society, Pittsburgh, PA         | March 16, 2009    |
| (3) | National Meeting of American Physical Society, New Orleans, LA        | March 12, 2008    |
| (2) | Optical Society of America: Ultrafast Phenomena XV, Pacific Grove, CA | July 31, 2006     |
| (1) | Excited State Processes Conference, Los Alamos National Lab           | August, 2001      |

