

APPENDIX A: BIOGRAPHICAL INFORMATION OF NEW FACULTY

L. MICHAEL HAYDEN

Department of Physics
University of Maryland, Baltimore County

Education:

B. S. 1978 United States Naval Academy, Physics (Graduated with Merit)
M. A. 1984 University of California Davis, Physics.
Ph. D. 1987 University of California Davis, Physics.

Experience in Higher Education:

2003-present Professor, Department of Physics, UMBC
1995-2003 Associate Professor, Department of Physics, UMBC
1991-1995 Assistant Professor, Department of Physics, UMBC
1990 Lecturer, Department of Physics, Macalester College, St. Paul, MN

Experience in other than Higher Education:

1987-1991 Principal Physicist, Unisys Defense Systems, St. Paul, MN
1978-1983 United States Naval Officer (I received four commendations during my tour)
1978-1979 Research Assistant, Naval Research Lab, Washington, D.C.

Honors and Patents:

Senior Faculty Fellow	American Society for Engineering Education	(1992)
Cottrell Scholar	Research Corporation	(1994)
U. S. Patent #4,887,884	"Capillary Nonlinear Optical Waveguide Device"	(12/19/89)
U. S. Patent #5,061,048	"Apparatus for Optical Beam Steering Using Nonlinear Optical Polymers"	(10/29/91)
U. S. Patent #5,076,658	"Nonlinear Optical Polymeric Fiber Waveguide"	(12/31/91)
U. S. Patent #5,724,460	"Photorefractive Thin Film Polymer Waveguide Two Beam Coupling (WTBC) Device"	(03/03/98)

Selected Publications:

1. "Maker Fringes Revisited: Second Harmonic Generation from Birefringent or Absorbing Materials", W. N. Herman and L. M. Hayden, *J. Opt. Soc. Am. B* **12**, 416 (1995).
2. "Fully Atomistic Modeling of an Electric Field Poled Guest-Host Nonlinear Optical Polymer", W.-K. Kim and L. M. Hayden, *J. Chem. Phys.* **111**, 5212-5222 (1999).
3. "Generation and Detection of Terahertz Radiation in Multi-layered Electro-optic Polymer Films", A. M. Sinyukov and L. M. Hayden, *Opt. Lett.* **27**, 55 (2002).
4. "New Materials for Optical Rectification and Electro-optic Sampling of Ultra-short Pulses in the THz Regime". L. M. Hayden, A. M. Sinyukov, M. R. Leahy, P. Lindahl, J. French, W. Herman, M. He, R. Twieg, *J. Polymer Sci. B. Polymer Phys.* **41**, 2492-2500 (2003).
5. "Efficient electro-optic polymers for THz applications", A. M. Sinyukov and L. M. Hayden, to appear in *J. Phys. Chem.* (2004)

SUE ANN BIDSTRUP ALLEN

School of Chemical and Biomolecular Engineering
Georgia Institute of Technology

Education:

B.S.	Chemical Engineering	1981	Massachusetts Institute of Technology
Ph.D.	Chemical Engineering	1986	University of Minnesota

Professional Experience:

2000-present	Georgia Institute of Technology, Professor
1994-2000	Georgia Institute of Technology, Associate Professor
1988-1994	Georgia Institute of Technology, Assistant Professor
1986-1988	Massachusetts Institute of Technology, Post-doctoral Associate

Honors, Awards Or Recognitions:

National Science Foundation, Presidential Young Award; DuPont Young Faculty Award; Georgia Tech Faculty Leadership Award for the Development of Graduate Research Assistants; Fellow of the Society of Plastic Engineers

Current Research Support:

Promerus, "Polynorbornene: A Low k, High Performance Dielectric"
Intel, "Electroless Copper Deposition and New Polymers for Advance Substrates"
Hitachi, "Variable Frequency Microwave Curing of Polymer Dielectrics on Organic Substrates"
NSF, "Multifunctional Dielectric Materials for Electrical/Optical Applications" (from Science and Technology Center on Materials and Devices for Information Technology Research)
NSF, "Enabling Technologies for Advanced Fluidics/Electronics/Optics Board" (from ERC on Low Cost Electronic Packaging)

Selected Publications:

Grove, N. R., Kohl, P. A., Bidstrup Allen, S. A., Jayaraman, S., and Shick, R., "Functionalized Polynorbornene Dielectric Polymers: Adhesion and Mechanical Properties", J. Polym. Sci.: Polym. Phys. Ed., **37**, 3003-3010 (1999).

Bhusari, D., Reed, H., Wedlake, M., Padovani, A., Bidstrup Allen, S. A., and Kohl, P. A., "Fabrication of Air-Gap Structures for Microfluidic, Microelectromechanical and Microelectronic Applications" IEEE Journal of Microelectromechanical Systems, **10**, 400-408 (2001).

Padovani, A.M., Rhodes, L., Bidstrup Allen, S. A., Kohl, P. A., "Chemically Bonded Porogens in Methylsilsequioxane, Part I: Structure and Bonding, Journal of the Electrochemical Society, **149**, F161-F170 (2002).

Padovani, A.M., Riester, L., Rhodes, L., Bidstrup Allen, S. A., Kohl, P. A., "Chemically Bonded Porogens in Methylsilsequioxane, Part II: Electrical, Optical and Mechanical Properties, Journal of the Electrochemical Society, **149**, F171-180 (2002).

Wu, X., Reed, H. A., Wang, Y., Rhodes, L. F., Elce, E., Ravikiran, R., Shick, R. A., Henderson, C. L., Bidstrup Allen, S. A., and Kohl, P. A., "Fabrication of Microchannels Using Polynorbornene Photosensitive Sacrificial Materials", Journal of the Electrochemical Society, **150**, H205-H213 (2003).

RIGOBERTO HERNANDEZ

School of Chemistry and Biochemistry
Georgia Institute of Technology

PERSONAL:

Born: December 4, 1967 Güinez, Havana, Cuba Citizenship: U.S.

ACADEMIC EXPERIENCE:

2002- **Associate Professor of Chemistry**, Georgia Institute of Technology
2000- **Co-Director**, Center for Computational Molecular Science & Technology,
 Georgia Institute of Technology
1996-02 **Assistant Professor of Chemistry**, Georgia Institute of Technology
1995-96 **Postdoctoral Fellow**, G. A. Voth, University of Pennsylvania
1994 **Feinberg Postdoctoral Fellow**, E. Pollak, Weizmann Institute of Science
1989 **Senior Technical Associate**, J. C, Tully and R, Tycko, AT&T Bell Laboratories
1986-89 **Laboratory Assistant**, K. K. Lehmann, Princeton University
1988 **Summer Research Associate**, L. Manzione, AT&T Bell Laboratory

EDUCATION:

1993 **University of California at Berkeley**, Ph.D. in Chemistry
 Thesis: Application of Semiclassical Methods to Reaction Rate Theory
1989 **Princeton University**, B.S.E. in Chemical Engineering and Mathematics,
 Thesis: Rigorous Bounds for the Ionization Potential of the Hydrogen Molecule

HONORS AND AWARDS:

- Goizueta Junior Faculty Professorship (2002-2005)
- Sigma Xi Southeast Regional Young Investigator (2002)
- Alfred P. Sloan Fellow (2000-2002)
- Sigma Xi Southeast Regional Young Investigator (2000 and 2002)
- Cottrell Scholar (Research Corporation, 1999-2004)
- Sigma XI Young Faculty Award (Georgia Tech Chapter, 1999)
- Blanchard Assistant Professor of Chemistry (1999-2001)
- NSF CAREER Award (1997-2002)
- Feinberg Postdoctoral Fellowship (1994)
- NSF Graduate Research Fellowship (1989 -1993)
- AT&T Cooperative Research Fellowship (1989 -1993)

RELEVANT PUBLICATIONS:

"Folding behavior of model proteins with weak energetic frustration," C. R. Locker, R. Hernandez, *J. Chem. Phys.*, in press.
"Mechanism for radical cation transport in duplex DNA oligonucleotides," C. -S. Liu, R. Hernandez, G. B. Schuster, *J. Am. Chem. Soc.*, **2004**, *126*, 2877-2884.
"An optimized mean first passage time approach for obtaining rates in activated processes," T. D. Shepherd and R. Hernandez, *J. Chem. Phys.* **117**, 9227-9233 (2002).
"A three-dimensional polymer growth model," M. T. Vogt and R. Hernandez, *J. Chem. Phys.*, **116**, 10485-10491 (2002).
"Activated dynamics across aperiodic stochastic potentials," T. D. Shepherd and R. Hernandez, *J. Phys. Chem. B* **106**, 8176-8181 (2002). (John C. Tully Festschrift issue)

DAVID S. GINGER

Department of Chemistry
University of Washington

i. Professional Preparation

<i>Institution</i>	<i>Field</i>	<i>Degree/Dates</i>
Indiana University, Bloomington	Chemistry and Physics	Double B.S. 1997
University of Cambridge	Physics	Ph.D. 2001
Northwestern University	Chemistry	Postdoc 2001-2003

ii. Appointments

2003-present Assistant Professor of Chemistry, University of Washington, Seattle
2001-2003 NIH and DuPont Postdoctoral Fellow, Northwestern University
1997-2001 Marshall Scholar and NSF Predoctoral Fellow, Dept. of Physics, Univ. of Cambridge

iii. Publications

(1) 5 Publications most closely related to the proposed project

- "The evolution of dip-pen nanolithography," D. S. Ginger, H. Zhang, C. A. Mirkin, invited review *Angew. Chem.-Int. Edit.* **43**, 30 (2004).
- "Direct patterning of modified oligonucleotides on metals and insulators by dip-pen nanolithography," L. M. Demers*, D. S. Ginger*, S. J. Park, Z. Li, S. W. Chung, C. A. Mirkin, *Science* **296**, 1836 (2002).
- "Direct-write dip-pen nanolithography of proteins on modified silicon oxide surfaces," J. H. Lim, D. S. Ginger, K. B. Lee, J. Heo, J. M. Nam, C. A. Mirkin, *Angew. Chem.-Int. Edit.* **42**, 2309 (2003).
- "Triplet formation and decay in conjugated polymer devices," A. S. Dhoot, D. S. Ginger, D. Beljonne, Z. Shuai, N. C. Greenham, *Chem. Phys. Lett.* **360**, 195 (2002).
- "Photoinduced electron transfer from conjugated polymers to CdSe nanocrystals," D. S. Ginger, N. C. Greenham, *Phys. Rev. B* **59**, 10622 (1999).

(2) Additional 5 Publications

- "Electrical properties of semiconductor nanocrystals," invited chapter, D. S. Ginger, N. C. Greenham, in *Semiconductor and Metal Nanocrystals* V. I. Klimov, Ed. (Marcel Dekker in press, 2003).
- "Enhanced Förster energy transfer in organic/inorganic bilayer optical microcavities," C. E. Finlayson, D. S. Ginger, N. C. Greenham, *Chem. Phys. Lett.* **338**, 83 (2001).
- "Electronic interaction between photoexcited poly(p-phenylene vinylene) and carbon nanotubes," H. Ago, M. S. P. Shaffer, D. S. Ginger, A. H. Windle, R. H. Friend, *Phys. Rev. B* **61**, 2286 (2000).
- "Charge injection and transport in films of CdSe nanocrystals," D. S. Ginger, N. C. Greenham, *J. Appl. Phys.* **87**, 1361 (2000).
- "Charge separation in conjugated-polymer/nanocrystal blends," D. S. Ginger, N. C. Greenham, *Synth. Met.* **101**, 425 (1999).

ANTAO CHEN

Applied Physics Laboratory
University of Washington

(i) Professional Preparation

Beijing Institute of Technology	Engineering Optics	B.S.	1983
Beijing Institute of Technology	Engineering Optics	M.S.	1989
University of Southern California	Electrical Engineering	M.S.EE	1994
University of Southern California	Electrical Engineering	Ph.D.	1998

(ii) Appointments

01/04-present	Senior Electrical Engineer. Applied Physics Laboratory, U. of Washington,
10/00-01/04	Distinguished Member of Technical Staff. Optoelectronics Center, Bell Laboratories, Lucent Technologies
3/98-9/00	Member of Technical Staff. Optoelectronics Center, Bell Laboratories, Lucent Technologies
8/93-3/98	Research Assistant. University of Southern California.
5/89-8/93	Staff Research Engineer. Chinese Academy of Electronics and Information Technology, Beijing, China
7/83-8/86	Optical System Design Engineer. Northwestern Optical Instrument Corp, Xi'an, China

(iii) Publications

- [1] A. Chen, V. Chuyanov, S. Garner, H. Zhang, W. H. Steier, J. Chen, J. Zhu, F. Wang, M. He, S. S. H. Mao, and L. R. Dalton, "Low-Vpi electrooptic modulator with a high μ chromophore and a constant-bias field," *Optics Letters*, vol. 23, pp. 478-480, (1998).
- [2] A. Chen, V. Chuyanov, F. I. Marti-Carrera, S. Garner, W. H. Steier, J. Chen, S. Sun, and L. R. Dalton, "Vertically tapered polymer waveguide mode size transformer for improved fiber coupling," *Optical Engineering*, vol. 39, pp.1507-1516, (2000).
- [3] A. Chen, V. Chuyanov, H. Zhang, S. Garner, S.-S. Lee, W. H. Steier, J. Chen, F. Wang, J. Zhu, M. He, Y. Ra, S. S. H. Mao, A. W. Harper, L. R. Dalton, and H. R. Fetterman, "DC biased electro-optic polymer waveguide modulators with low half-wave voltage and high thermal stability," *Optical Engineering*, vol. 38, pp. 2000-2008, (1999).
- [4] W. H. Steier, A. Chen, S. Garner, H. Zhang, V. Chuyanov, L.R. Dalton, F. Wang, A.S. Ren, C.Zhang, G. Todorova, A. Harper, H.R. Fetterman, D. Chen, A. Udupa, D. Bhattacharya, and B. Tsap, "Polymer electro-optic devices for integrated optics," *Chemical Physics*, vol. 245, pp. 487-506, (1999).
- [5] D. Chen, H. R. Fetterman, A. Chen, W. H. Steier, and L. R. Dalton, "Demonstration of 110 GHz electro-optic polymer modulators," *Applied Physics Letters*, vol. 70, pp. 3335-3337, (1997).
- [6] L.R. Dalton, W.H. Steier, B.H. Robinson, C. Zhang, A. Ren, S. Garner, A. Chen, T. Londergan, L. Irwin, B. Carlson, L. Fifield, G. Phelan, C. Kincaid, J. Amend, and A. Jen, "From molecules to opto-chips: organic electro-optic materials," *Journal of Materials Chemistry*, vol. 9, pp. 1905-1920, (1999).
- [7] B.H. Robinson, L.R. Dalton, A.W. Harper, A. Ren, F. Wang, C. Zhang, G. Todorova, M. Lee, R. Aniszfeld, S. Garner, A. Chen, W.H. Steier, S. Houbrecht, A. Persoons, I. Ledoux, J. Zyss, and A.K.Y. Jen, "The molecular and supramolecular engineering of polymeric electro-optic materials", *Chemical Physics*, vol. 245, pp. 35-50, (1999).

ERNEST R. DAVIDSON

Department of Chemistry
University of Washington

a. Professional Preparation

Rose Polytechnic Inst.	Chem. Eng.	BSc	1958
Indiana University	Chemistry	PhD	1961
Univ. of Wisconsin	NSF Post Doctoral		1961

b. Appointments

Univ. of Washington	Professor	2002-
Univ. of North Carolina	Visiting Scholar	2002-
Indiana University	Professor Emeritus	2002-
Indiana University	Chair of Chemistry Dept.	1999-2002
Indiana University	Robert and Marjorie Mann Chair of Chemistry	1999-2002
Indiana University	Distinguished Professor	1986-2002
Indiana University	Professor	1984-1986
Univ. of Washington	Professor	1968-1984
Univ. of Washington	Associate Professor	1965-1968
Univ. of Washington	Assistant Professor	1962-1965

c. Publications

A TDDFT description of the low-energy excited states of copper and zinc metalloenediynes, A. E. Clark, E. R. Davidson, and J. M. Zaleski, Chem. Comm. 23, 2876-77 (2003).
<http://php.indiana.edu/~davidson/articles/405.pdf>

Methanolysis and Phenolysis Routes to Fe₆, Fe₈ and Fe₁₀ Complexes, and their Magnetic Properties: A New Type of Fe₈ Ferric Wheel, C. Cañada-Vilalta, T. E. O'Brien, M. Pink, E. R. Davidson, and G. Christou, Inorg. Chem. 42(24); 7819-7829 (2003).
<http://php.indiana.edu/~davidson/articles/404.pdf>

An investigation into the relative influence of alkoxide and thiolate ligands on the metal-carbon triple in X₃MCH compounds, where M = Cr, Mo and W and X = OH, SH, OCH₃, OCF₃, and SCF₃ from electronic structure calculations, M.H. Chisholm, E.R. Davidson, and K.B. Quinlan, Polyhedron 22 (1), 145-152 (2003).
<http://php.indiana.edu/~davidson/articles/398.pdf>

Insights into the Schrock "chop-chop" reaction gained from density functional theory and preparation and structure of W₂(alpha-PhCCPh)(SC₆H₄-2-Me)₆, M.H. Chisholm, E.R. Davidson, M. Pink and K.B. Quinlan, Chem. Comm. 23, 2770-2771 (2002).
<http://php.indiana.edu/~davidson/articles/395.pdf>

Insights into the metathesis reaction involving M-M, C-C and M-C triple bonds from computations employing density functional theory on model compounds M₂(OH)₆ and M₂(SH)₆ where M = Mo and W, M.H. Chisholm, E.R. Davidson, and K.B. Quinlan, J. Am. Chem. Soc. 124, 15351-15358 (2002). <http://php.indiana.edu/~davidson/articles/394.pdf>