

CURRICULUM VITAE

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1. GENERAL INFORMATION

1-A. Educational background

1991	Ph.D.	University of Iowa, <i>Atomic Molecular and Laser Physics</i> .
1987	CERTIFICATE:	International Center for Theoretical Physics; Trieste, Italy.
1985	M.S.	Addis Ababa University <i>Physics: Surface Science</i> .
1977	B.S.	Addis Ababa University <i>Physics Sec. Education/with a minor in Math</i> .

1-B. Area of field of specialization

Experimental and Theoretical (Computational) Atomic, Molecular and Optical Physics /and Chemical Physics

1-C. Teaching and other professional experience

2009-present	Adjunct professor, Addis Ababa University, Ethiopia
2006-	Director, NOAA-ISET Center
2004	Fellow: National Institute of Aeronautics (NIA)
2003-Present	Professor
2003	Visiting professor, Laboratory of Theoretical Chemistry Facultes de St-Jerome 13397 MARSEILLE
2000-2001	JILA visiting fellow
2001-2006	Chair, Department of Physics
1998- 2003	Associate Professor, Department of Physics, North Carolina A&T State University.
1993-1998	Assistant Professor: Department of Physics, North Carolina A&T State University.
1997 spring	Acting Chairman: Department of Physics, North Carolina A&T State University.
1996 (summer) and	NRC/HBCU Faculty Fellow: Oak Ridge National Laboratory
1997 (summer)	Chemical and Biological Physics Section
1995(summer)	Visiting Assistant Professor: University of Connecticut, Department of Physics, Storrs.
1995(summer)	AWU-DOE Faculty Fellow: Los Alamos National Lab.
1994(summer)	Visiting Assistant Professor. University of Utah, Department of Chemistry,
1991-1993	Post Doctoral Fellow: University of Utah, Chemistry Department, Salt Lake City, Utah
1988-1991	Research Assistant: University of Iowa, Department of Physics, and Iowa City, Iowa.
1985-1987	Lecturer: Addis Ababa University, Addis Ababa, Ethiopia.
1983-1985	Research Assistant, Addis Ababa University, Addis Ababa, Ethiopia.

1-D. List honors and awards

- University of Iowa, College of Liberal Arts, Alumni Fellow, 2010
- Outstanding Faculty Mentor Award, NCAMP (NSF) April 1998.
- Faculty Award, National Honors, College of Arts and Sciences April 1998.
- JILA visiting fellowship, 2001-2002
- Named Outstanding Senior Researcher for A&T, 2001-2002
- Phi Kappa Phi
- Sigma Pi Sigma ΣΠΣ National Physics Honor Society.
- Teacher of the Year, 2006

1-E. Membership (s) in professional organizations

-NSBP: National Society of Black Physicists.
 -APS: American Physical Society
 -ACS: American Chemical Society
 -EPS: Founder of the Ethiopian Physics Society.
 -AAAS : American Association for the Advancement of Science
 -AAPT: American Association of Physics Teachers
 AMS: American Meteorological Society

2. DETAILS OF PROFESSIONAL EXPERIENCE: RESEARCH

2-A. Summary of research productivity

Peer reviewed publications: 1991-2011	37
Abstracts, proceedings 1991-2011	68
Research grants funded as PI	13 proposals (\$16,855,439)
Research grants funded as Co-PI	4 proposals (\$1,637,691)

2-B. Previous research

- Spectroscopy of Transition State Dynamics (1988-1991)
- State-to- State Photochemistry (1988-1991)
- Laser Spectroscopy and Photodynamics (1991-1993)
- Electronic Structure Calculations, Quantum calculations (1991-Present)
- Photodetachment of H⁻ (summer 1995) (Los Alamos National Laboratory)
- Photochemistry of Metal CVD precursors in cluster environment and nano chemistry within clusters: Oak Ridge National Laboratory (1996) NCAT: 1999-2005

2-C. Current research

Spectroscopy of Transition State Dynamics (1998-present)

The research includes the study of laser induced chemical reactions within molecules, and laser induced energy transfer collisions between atoms and molecules. Current studies include laser induced chemical reaction dynamics of LiH₂, LiCH₄ and other hydrocarbon complexes in gas phase, and kinetic and dynamic studies of the quenching of excited states of Li by several alkane and alkene hydrocarbons, rare gases and nitrogen.

Atmospheric Chemistry (2006-

Focus: Characterizing organic and inorganic acids in the atmosphere emitted by Biomass burning and the study their impact on climate.

1. Negative Ion proton transfer mass spectrometry to Measure: a) Acidities of gas-phase acids; b) Rate of H-transfer; c) Water cluster characterization. The goal is to get estimates of the free energy of hydration of carboxylate ions, and determination of the effective gas phase acidity of hydrated carboxylate ions. (NSF-Funded)
2. Investigate vibrational overtone initiated photodissociation processes that are significant sources of atmospheric radicals using cavity ring down spectroscopy. The vibrational O-H overtone absorption cross sections of carboxylic acids and other OH-containing species are necessary quantities to calculate the photochemical reaction rate constant (*J*) for reactions initiated by the excitation of the O-H overtone. (NOAA, NSF Funded)
3. Measurement of the Henry's law coefficient and first order loss rate of Isocyanic Acid in Water Solutions- Solubility studies (NOAA-Funded)
4. Measurement of optical properties of biomass aerosols using cavity ring down spectroscopy (DoD-Current Funding)

2-D. Current and former collaborations

- **Laboratoire Aime Cotton and ASCI, Campus d'Orsay, France and, Laboratory of Theoretical Chemistry Facultes de St-Jerome 13397 MARSEILLE. 2000-present:** Theoretical and computational studies of Li-H₂, Li-N₂ and Li-CH₄ collisions.
- **Duke University, UNC Chapel Hill and Stanford University: 2000-present:** ITR: Computational Geometry for Structural Biology ad Bioinformatics.
- **JILA Research:** Joint Laboratory Astrophysics (NIST)/University of Colorado, Boulder. **2000-2001** -Ultra fast studies of molecular wave packet dynamics and time-resolved FTIR emission studies of molecular photofragmentation.

- **Addis Ababa University; Ethiopia; 2004-present:** geosciences, atmospheric sciences, and statistical physics.
- **PENN STATE, University of the Witwatersrand, South Africa:** Partnership for international research and education program in geosciences. **2004-present.**
- NOAA –ISET Center **Partner (Subcontract) Minority Serving Institutions:** University of Alaska Southeast (UAS); California State University-Fresno (CSU-Fresno); City University of New York (CUNY), Fisk University (FU); University of North Carolina at Pembroke (UNCP). **Partner (Subcontract) Majority Serving Institution:** North Carolina State University (NCSSU); University of Minnesota (UM)
- **NOAA-ESRL:** Chemical Sciences Division: Atmospheric Chemistry

2-E. Refereed publications

Book Chapters:

S. Bililign, B Hattaway, “Energy Transfer and Reactions In Li(np) –Ar, H₂, CH₄ Collisions,” *Recent Research Developments in Chemical Physics*, **39** (2002) 249-269, Transworld Research Network.

I. Wallace, D. J. Funk, J. G. Kaup, **Solomon Bililign**, M. D. Morse and W. H. Breckenridge. "Half-Collision Studies of Singlet-to-Triplet Energy Transfer within Electronically Excited CdH₂ and CdD₂ Complexes." *The Chemical Dynamics and Kinetics of Small Radicals*, Eds B.Liu and A. Wagner (World Scientific, 1996).

Solomon Bililign and P. D. Kleiber. "Reaction Dynamics of Na (4²P) + H₂: Effects of Reactant Orbital Alignment on product State distribution," *Spectral Line Shapes*, **V6**, Editors: Lothar Frommhold and John Keto, (AIP Press, NY 1990)

Journal Articles:

Israel Begashaw, Marc N. Fiddler, **Solomon Bililign**, Steven Brown, “Measurement of the fourth O-H overtone absorption cross section in acetic acid using cavity ring-down spectroscopy” *The Journal of Physical Chemistry A*, **2011**, *115*, 753-761

Bililign, S., Lin, Y-L., Kurkalova, L., Rastigeyev, Y., Schimmel, K., Bae, S., Davis, R., Ilias, S., Kyei, Y., Uzochukwu, G., “*CLIMATE AND WATER RESOURCES: A CHALLENGE TO INTEGRATED SCIENCE/SOCIAL POLICY FORMULATION*”, *Convergence Review*, **2** (2009).

Marc M. Fiddler; Israel Begashaw ; Matthew A. Mickens; Michael S. Collingwood Zerihun Assefa’ and **Solomon Bililign**, “Laser Spectroscopy for Atmospheric and Environmental Sensing,” *Sensors*. **2009**, *9*, 10447-10512.

Natanael Semmineh¹ and **Solomon Bililign**’ Denis Hagebaum-Reignier and Gwang-Hi Jeung “*Experimental Studies of Collisions of excited Li (4P) atoms with C₂H₄, C₂H₆, C₃H₈, and Theoretical interpretation of the Li-C₂H₄ System.*” *Chemical Physics* **355** (2009) 157–163,

*Kevin Weddburn, Mel Levy, **Solomon Bililign**, Robert Gdanitz, ““Geometries and stabilities of 3d-transition metal-cation benzene complexes, M+Bz_n (M = Sc-Cu, n = 1, 2)”,”*Chem. Phys.* **326**, 600 (2006)

*Komaragiri, Vivek; McCarter, Benjamin; **Bililign, Solomon**; Hagebaum-Reignier, Denis; Ledentu, Vincent; Jeung, Gwang-Hi Jeung, “Experimental and Theoretical Studies of the Quenching of Li (3p, 4p) by N₂.” *Journal of Chemical Physics*, **123**, 24303 (2005).

James Tucker Swindell II, Benjamin McCarter, Vivek Koramagiri and **Solomon Bililign** “QUENCHING OF Li (3P) BY CH₄, C₂H₄, C₂H₆, C₃H₈,” *Chem. Phys.* **305**,299 (2004)

*Brian C. Hattaway, **Solomon Bililign**, Lionel Uhl, V. Ledentu and Gwang-Hi Jeung, “Energy transfer in Li (4p) + (Ar, H₂ and CH₄) Collisions,” *J. Chem. Phys.*, **120**, 1739 (2004)

*N. Vaval and **S. Bililign**, and Robert J. Gdanitz "Density functional study on the structure and stability of positive iron rare-gas complexes, Fe+Xn (X = Ar, Xe; n=1-6," *Chemical Physics* **290**/2-3,171 – 176 (2003).

Dr. Solomon Bililign

Vitae, 2011

***S. Bililign**, B. C. Hattaway, and Gwang-Hi Jeung "Nonradiative Energy Transfer in Li (3p) + CH₄ Collisions." *J. Phys. Chem. A* **106**, 222, (2002).

S. Bililign, B. C. Hattaway, T. L. Robinson, and Gwang-Hi Jeung "Far-Wing Scattering Studies on the Reaction Li* (2p, 3p) + H₂ → LiH (v'= 1, 2, J'') + H", *J. Chem. Phys.* **114**, 7052 (2001).

***S. Bililign**, B. C. Hattaway, Neri Geum and Gwang-Hi Jeung, "Energy Transfer in Li (3p) - H₂ Collisions" *J. Phys. Chem. A* **104**, 9454-9458 (2000).

C. S. Feigerle, **S. Bililign** and John C. Miller, "Nanochemistry: Chemical Reactions of Iron and Benzene within Molecular Clusters," *Journal of Nanoparticle Research. Volume 2(2)* 147-155 (June 2000).

B. E. McCarter, **S. Bililign**, C. S. Feigerle, J. C. Miller "Nanochemistry: Iron Cluster Reactions with Methyl Iodide," *J. Phys. Chem.* **103**, 6740 (1999).

S. Bililign, C. S. Feigerle, and John. C. Miller. "Inverse Laser Ablation Formation and Chemistry of Nanoparticles from Gaseous Precursors." *Applied Surface Science.* **127**, 344 (1998).

S. Bililign, C. S. Feigerle, John C. Miller and M. Velegrakis. "Non-Statistical Bond Breaking in the Multiphoton Ionization/Dissociation of [Fe (CO)₅]mAr_n Clusters." *J. Chem. Phys.* **108**, 6312 (1998).

J.T. Bahns, L. Lynds, W.C. Stwalley, V. Simmons, T. Robinson and **S Bililign**. "Airborne Mercury Detection by Resonant UV Laser Pumping." *Optics Letters.* **22**, 727 (1997).

S. Bililign, L. Liu, C. S. Feigerle and John C. Miller. "Metal ion Chemistry Initiated by Ionization/Dissociation of Organo- Metallic Precursors." *J. Phys. Chem.* **101**, 4569 (1997).

***Solomon Bililign**, J.G. Kaup and W.H. Breckenridge. "Full and Half-Collision Studies of Metal Atom Singlet -to Triplet Deactivation Induced by Rare Gas Atoms." *J. Phys. Chem.* **99**, 7878 (1995).

***Solomon Bililign**, Maciej Gutowski, Jack Simons and W.H. Breckenridge. "Potential Energy Curves and Van der Waals Bonding in M (np²P). RG²(²T) Excited State and M⁺. RG Ground States. (M=Li Na; RG= He, Ne)." *J. Chem. Phys.* **100**, 8212, (1994).

***Solomon Bililign**, Maciej Gutowski, Jack Simons and W. H. Breckenridge. "Singlet-to-Triplet transfer via ¹Π_{1/2}/³Σ₁⁺ curve crossing in Group II and XII Metal Atom/Rare Gas Systems." *J. Chem. Phys.* **99**, 3815, (1993).

***Solomon Bililign**, M. D. Morse and W. H. Breckenridge. "Predissociation Life Times of Vibrational Levels of excited 1B₁ (K'a=0) Electronic States of CdH₂ and CdD₂ Complexes." *J. Chem. Phys.* **98**, 2115 (1993).

P. D. Kleiber, T. H. Wong and **Solomon Bililign**. "Collisional Energy Transfer in Na(4p-3d)-He, and H₂ collisions." *J. Chem. Phys.* **98**, 1101 (1993)

W.C. Stwalley, P. D. Kleiber, K. M. Sando, A. M. Lyyra, L. Li, S. Ananthamurthy, **Solomon Bililign**, H. Wang, J. Wang and Z. Zafurpulos. "Metal-Metal and Metal-Hydrogen Reactive Transition State Faraday." *Discussion of the Chemical Society.* **91**, 97 (1991).

Solomon Bililign and P. D. Kleiber "Initial Rotational Quantum State Distribution of NaH (NaD) in the reaction of Na (4²P) with H₂, D₂, and HD." *J. Chem. Phys.* **96**, 213 (1992).

Solomon Bililign, P. D. Kleiber, W. R. Kearney and K. M. Sando. "Reactive Collision Dynamics of Na (4²P) + H₂, D₂ and HD: Experiment and Theory." *J. Chem. Phys.* **96**, 218 (1992).

Solomon Bililign and P. D. Kleiber. "Reaction Dynamics of Na (4²P) + H₂: Effects of Reactant Orbital Alignment on Reactivity and Product Rotational State Distribution." *Phys. Rev.* **A42**, 6938 (1990).

Refereed Proceeding Articles and Reports:

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Solomon Bililign "Scattering State Spectroscopy as a probe of Chemical Reaction Dynamics and Non-Radiative Energy Transfer: Li(np)⁺ M System (M = H₂, N₂, CH₄, (n = 2,3,4)). [In Press: Refereed Proceeding: Proceedings of the 22nd Course of the International School of Atomic and Molecular Spectroscopy Erice, Sicily, Italy June 5-21,2005 by **Editor:** Baldassare Di Bartolo

X.M.Zhao, M.Gulley, H.C.Bryant, C.E.M.Strauss, D.J.Funk, A.Stinz, . D.Risolve, G. Kyrala, W. Ingalls and **S.Bililign**. "Excess Photon Detachment of Negative Hydrogen Ions" Contributed paper to the 1996 QELS Conference.

I. Wallace, D. J. Funk, J.G. Kaup, **Solomon Bililign**, M. D. Morse and W. H. Breckenridge. "Half-Collision Studies of Singlet-To triplet Energy Transfer: Action Spectroscopy and Predissociation Dynamics of Electronically Excited CdH₂ and CdD₂ complexes." *Proceedings of SPIE-Int.Soc.Opt. Eng.* 1858, (247) Editor: Cheuk.Yi.Ng. April (1993).

P. D. Kleiber and **Solomon Bililign**. "Excited State reactions of Alkali with Hydrogen." *Proceedings of the Conference on Atomic and Molecular Collisions in Excited State*. Edited by B. Stumpf [Moscow, Idaho: University of Idaho,], p. 123 (1991).

P. Mikusik and **Solomon Bililign**. "Influence of Argon Ion Sputtering and Annealing on the Surface Composition of Amorphous Alloy Fe₄₀Ni₄₀B₆Si₄ by XPS." **Internal Report**, ICTP, Trieste, Italy, (1987).

2-F. Presentations (Research conference bulletin abstracts and seminars)

Solomon Bililign: Study of Climate Forcing Caused by Aerosols and Chemical Products of Biomass Burning-Laboratory Spectroscopic Studies. *Seminar given at Bahir Dar University, Ethiopia and Mekelle University, Ethiopia*

Solomon Bililign: Research and education for sustainable development : The need for interdisciplinary approach to address problems of global significance. *Seminar given at Bahir Dar University, Ethiopia and Mekelle University, Ethiopia*

Schimmel, K., Watlington, S., Worrell, T., Jost, M., Bohn, J., Bililign, S. "Enhancing STEM Education in Guilford County Schools through Teacher Research Experiences," The Naval STEM Forum, Alexandria, VA, June 15-16, 2011.

Bililign, S., Bohn, J., Schimmel, K., "NOAA ISET Cooperative Science Center: An Innovative University/Federal Agency STEM Education Partnership," The Naval STEM Forum, Alexandria, VA, June 15-16, 2011.

Bohn, J., Schimmel, K., Bililign, S., "ISETCSC's Outreach to Increase Participation and Diversity of STEM Pipeline," The Naval STEM Forum, Alexandria, VA, June 15-16, 2011.

Marc N. Fiddler, Stefan Boskovic and Solomon Bililign, "Measurement of the Absorption Coefficient of the Fourth O-H overtone of Peracetic Acid using Cavity Ring-down Spectroscopy," *NOAA-ISETCSC Day*, Greensboro, North Carolina, February 11, 2011. (poster)

Marc N. Fiddler, Stefan Boskovic and Solomon Bililign, "Characterizing the Fourth O-Overtone of Peracetic Acid using Cavity Ring-down Spectroscopy," *The 25th Annual Ronald E. McNair Symposium*, Greensboro, North Carolina, January 26-28, 2011. (poster, awarded Certificate of Merit)

Solomon Bililign, Israel Begashaw and Marc N. Fiddler, "Measurement of the Fourth O-H Overtone Absorption Cross Section in Acetic Acid using Cavity Ring-down Spectroscopy," *77th Annual Meeting of the Southeastern Section of the American Physical Society*, Baton Rouge, Louisiana, **October 20-23, 2010**, published in the Bulletin of the American Physical Society, 55(10), GC-2. (oral)

Solomon Bililign, Session Chair for "The Role of Physics in Atmospheric, Ocean, and Earth Sciences," *77th Annual Meeting of the Southeastern Section of the American Physical Society*, Baton Rouge, Louisiana, **October 20-23, 2010**.

Solomon Bililign, "Research and Education in Geosciences – The Need for an All-Inclusive Interdisciplinary Approach to Address Problems of Global Significance," University of Iowa, Physics Department, Iowa, **September 24, 2010**. (invited lecture)

Anthony K. Cochran, James M. Roberts, Ranajit Talukdar, Patrick Veres and Solomon Bililign, "Measurement of the Henry's Law Coefficient and First Order Loss Rate of Isocyanic Acid in Water Solutions," *American Geophysical Union*, San Francisco, California, **December 2010. (poster)**

Marc N. Fiddler and Solomon Bililign, "Selection of an Optimal Reagent Ion for the Chemical Ionization of Atmospherically Relevant Carboxylic Acids," *Proceedings of the 58th ASMS Conference on Mass Spectrometry and Allied Topics*, Salt Lake City, Utah, **May 23-27, 2010.**

Anthony K. Cochran, Marc N. Fiddler and Solomon Bililign, "Development of Negative Ion Proton Transfer Reaction Time-of-Flight Mass Spectrometry (NI-PTR TOF MS) for the Measurement of Organic Acids in the Troposphere," *Proceedings of the 58th ASMS Conference on Mass Spectrometry and Allied Topics*, Salt Lake City, Utah, **May 23-27, 2010.**

DEVELOPING A PIPELINE OF UNDERREPRESENTED MINORITY STUDENTS FOR THE GEOSCIENCES THROUGH AFRICA-ARRAY" Abstract submitted to 2010 GSA Denver Annual Meeting (31 October –3 November 2010)

Begashaw Israel, Collingswood, M.; Bililign, S. "Absorption cross section for the ν_{OH} stretch of acetic acid and peracetic acid" *Eos Trans. AGU*, 2009, 90(52), Fall Meet. Suppl. Abstract A21C-0255, 2009.

Israel Begashaw, Michael Collingswood, Solomon Bililign "Absorption cross section for the ν_{OH} stretch of acetic acid and peracetic acid" *Poster Presentation: A21C-0255* December 15, 2009 AGU Fall Meeting 2009

Israel Begashaw, Michael Collingswood, Solomon Bililign "Measuring the ν_{OH} stretch absorption cross section of acetic acid and peracetic acid by cavity ring-down spectroscopy" *Poster Presentation: P1.41 NOAA-EPP Fifth Education and Science Forum*, Howard University, November 12, 2009

Marc N. Fiddler, NCAT, Greensboro, NC; and A. K. Cochran and S. Bililign "Characterization of oxidized volatile organic compounds using proton transfer reaction time-of-flight (PTR-ToF) mass spectrometry and ion/molecule reactions" *Poster Presentation: P1.41 NOAA-EPP Fifth Education and Science Forum*, Howard University, November 12, 2009

Anthony K. Cochran, NCAT, Greensboro, NC; and S. Bililign, C. Melvin, and M. Fiddler "Development of Negative ion proton transfer reaction time-of-flight mass spectrometry (NI-PTR TOF MS) for the measurement of gas phase acids in the troposphere" *Oral Presentation: P1.41 NOAA-EPP Fifth Education and Science Forum*, Howard University, November 12, 2009.

HANSEN, Samantha E., NYBLADE, Andrew A., BILILIGN, Solomon, **DEVELOPING A PIPELINE OF UNDERREPRESENTED MINORITY STUDENTS FOR THE GEOSCIENCES THROUGH AfricaArray"** accepted for the 2009 Portland GSA Annual Meeting (18-21 October 2009)

Israel Begashaw, Solomon Bililign, "Cavity ring down spectroscopy for atmospheric research," *Bulletin of the American Physical Society*, Volume 53, No. 13, 2008.

Cochran, A K; Begashaw, I; Jessamy, C Bililign, S; Development of Negative Ion Proton Transfer Reaction Time-of-Flight Mass Spectrometry (NI-PTR TOFMS) for the Measurement of Gas Phase Acids in the Troposphere; *Eos Trans. AGU*, 2008, 89(53), Fall Meet. Suppl; A21B-0157

Organized and Chaired a session "Forefront Atmospheric Physics and Geophysics" at the 75th Annual Meeting of the Southeastern Section of APS Thursday–Saturday, October 30–November 1 2008; Raleigh, North Carolina. The following presentations were made at this meeting:

"NOAA Interdisciplinary Scientific Environmental Technology Cooperative Science Center"

Invited Speaker: Solomon Bililign

"Cavity Ring Down Spectroscopy for Atmospheric Research"

Israel Begashaw, Solomon Bililign, Anthony Cochran, Christopher Jessamy

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Since 2007, Organized and chaired three sessions on “**Earth and Planetary System Science**’ at the National Society of Black Physicists and National Society of Hispanic Physicists” and member of organizing committee of these conferences

Boston: February: 2007

Washington DC: February 2008

Nashville TN- February: 2009

Invited talk in 2008: “Spectroscopic techniques for atmospheric analysis”

“Far Wing Scattering Spectroscopy to Study chemical reaction and non-reactive energy transfer processes”

Chemistry Department colloquium, Oct 4, 2007.

“Understanding Climate Change- Capstone Interdisciplinary Problem of the Century.” 3rd National Conference on Environmental Science and Technology, Sept. 12., 2007

“Towards an Integrated Approach to the Earth System Study” presentation at the AfricaArray workshop on the campus of NCA&T, Feb 13, 2008.

“Development of Negative Ion-Proton Transfer Reaction Mass Spectrometry (NI-PTRMS) for Gas-Phase Measurement of Acids in the Atmosphere” Poster presentation at the National Society of Black Physicists and National Society of Hispanic Physicist, Feb 21, 2008, Washington DC, and Chemical Sciences Symposium, NCA&T, Feb. 28, 2008. Oral presentation at the EBAL 2008 (Environmental and Biological Applications of Lasers) Cairo, Egypt, Jan 2008.

“Spectroscopic Techniques for Atmospheric Applications” Invited talk at the National Society of Black Physicists and National Society of Hispanic Physicist, Feb 21, 2008, Washington DC

“ Spectroscopic techniques to study chemical reaction and non reactive energy transfer processes and environmental applications” Invited lecture at the EBAL 2008 (Environmental and Biological Applications of Lasers) Cairo, Egypt, Jan 2008.[Was unable to travel due to personal problems, but talk was sent to the organizers)

“Scattering State Spectroscopy as a probe of Chemical Reaction Dynamics and Non-Radiative Energy Transfer: Li(np)+ M System (M = H₂, N₂,CH₄, (n = 2,3,4).” Presented at the NATO Advanced Study Institute, International School of Atomic and Molecular Spectroscopy, 22nd Course: New developments in Optics and Related Fields Ettore Majorana Center for Scientific Culture Erice, Sicily, ITALY: June 6-21, 2005.

“Scientific Revolutions and Social Change” FUTURES Retreat, NCA&T, April 2005, Aggie Report, 2005

“The social, ethical and educational challenges of nanotechnology.” Cultural Studies Symposium, NCA&T State University, march 19, 2005

Collisional Energy Transfer in Li(np, n = 2,4) + N₂ and Li(4p) + CH₄, C₂H₄, C₂H₆, C₃H₈ Interactions. 71st Annual Southeastern Section meeting of the American Physical Society, Oak Ridge, TN, Nov, 2004; Bulletin of the American Physical Society, V. 49, No. 7, 2004

Density Functional Theory Studies of Transition metal-Ion-Benzene Sandwich Complexes. 71st Annual Southeastern Section meeting of the American Physical Society, Oak Ridge, TN, Nov, 2004; Bulletin of the American Physical Society, V. 49, No. 7, 2004

Physical and Chemical quenching of Li(3p) by several gases. Colloquium at Morgan State University, Department of Chemistry and Physics, March 2004

Nonradiative Energy Transfer in Li (4p) + (Ar, H₂, CH₄) Collisions, Presented at the National Conference of Black Physicist, Washington DC, Feb. 2004

Energy Transfer in Li(4p) + (Ar, H₂, CH₄) Collisions Presented at the SESAPS meeting, Wilmington, NC Nov. 2003.

Reactive and non reactive quenching of Li(3p) by CH₄, C₂H₄, C₂H₆, C₃H₈. Presented at the SESAPS meeting, Wilmington, NC Nov. 2003.

Reactive and non-reactive quenching of Li(np) by Ar, H₂, CH₄, C₂H₆, C₃H₈ *Colloquium*, at Laboratoire de Chimie Théorique et Modélisation Moléculaire Université de Provence - Marseille Cedex 20, 2003.

Chemical Physics Research at NCA&T: Reactive and non reactive quenching of Li(np) by several Gases. Colloquium at the Department of Physics, Addis Ababa University, Ethiopia, July 2003.

Research and Education in Chemical Physics at A&T, talk given at the annual meeting of the National Society of Black Physicists, Atlanta, GA, February, 14, 2003, at the National Science Foundation, Division of Chemistry, December 11, 2002, at the NC AAPT meeting March 22, 2003, and at the Annual Life and Physical Sciences Symposium, NC A&T Biology Dept., April 5, 2003.

DFT Studies of the Structure of Fe⁺ R_n (R = Ar, Xe, n = 1 – 6) Clusters. Presented at the American Physical Society Division of Atomic, Molecular and Optical Physics Meeting, May 29-June 1, 2002, Williamsburg, VA.

Red-Wing scattering Studies of Li(4p) + Ar, H₂ and CH₄ Collisions. Presented at the American Physical Society Division of Atomic, Molecular and Optical Physics Meeting, May 29-June 1, 2002, Williamsburg, VA.

Energy Transfer in Li(3p) + Ar, H₂ and CH₄ Collisions: A comparative study. Presented at the American Physical Society Division of Atomic, Molecular and Optical Physics Meeting, May 29-June 1, 2002, Williamsburg, VA.

Energy Transfer and Reactions in Li*(3p) + H₂ Collisions. A seminar presented at the Department of Physics, East Tennessee State University, Johnson City, TN, Oct. 30,2000

Scattering State Spectroscopy of the reaction Li*(3p) + H₂ ---LiH (v'' = 1, 2, J'') + H APS April 2001 meeting, Washington D.C., April 28, 2001

From Diatomic Molecules to Clusters and Beyond: Theory and Experiment. A seminar presented at the Department of Computer Science, Duke University, Durham, NC, Oct. 19,2000

Quenching of Li(3p) by H₂ and Ar. Presented at the LS-NCAMP Research Conference, Winston Salem State University, NC , Feb. 2000

Formation of LiH by Far Wing Scattering of the Li*(2p)+H₂ complex. Presented at the 66th SESAPS meeting Nov 7-9, 1999, Chapel Hill, NC.

Formation and Chemistry of Nanoparticles from Gaseous Precursors by Multiphoton Ionization/Dissociation. Presented at the Gordon Research Conference On Clusters, Nanocrystals, & Nanostructures Connecticut College July 24 - July 29, 1999.

Multiphoton Ionization/Dissociation Studies of Iron Reactions in Gas Phase. Presented at the American Chemical Society Southeast Regional Meeting, Knoxville, TN, Oct. 17- 20, 1999

Multiphoton Ionization/dissociation of Benzene-Fe (CO)₅ and Methanol-Fe (CO)₅ Clusters . Presented at the APS (American Physical Society) Meeting in Atlanta GA., March 1999

Model Potentials for Group II Metal-atom-Rare-Gas atom Interaction .Presented at the APS (American Physical Society) Meeting in Atlanta GA., March 1999

Laser-induced transition metal chemistry within clusters Presented at the 9th International Symposium on Resonance Ionization Spectroscopy: New Directions and Applications June 21 - June 25, 1998, The University of Manchester Institute of Science and Technology.

Organometallic Nanochemistry in Gas-Phase Clusters. Presented at the American Chemical Society Southeastern Regional Meeting, Nov 4-7, 1998, RTP, NC

Ab initio studies of the Na(3s).Ar, ²Σ Na (3p).Ar, ²Σ and Na(4p).Ar, ²Σ states. Presented at the Second Annual NCAMP Research Conference, UNC Charlotte, April 4, 1998.

A New Model Potential for Excited State Metal Atom-Rare Gas Interactions. Presented at the Second Annual Life and Physical Sciences Research Symposium, Feb 21, 1997, NCA&T.

Laser Induced Organometallic Chemistry Within Clusters. Presented at the sixth Annual Consortium on Nanostructured Materials, University of Kentucky, Lexington KY, Oct. 24-26, 1997.

Inverse Laser Ablation: Formation and Chemistry of Nanoparticles from Gaseous Precursors. Presented at the fourth International Conference on Laser Ablation (COLA 97), Asilomar, CA July 20-25, 1997

Metal ion Chemistry Initiated by Ionization/Dissociation of Organo-Metallic Precursors. Presented
1. Fourth Winter Gordon Research Conference on Structures, Energetics and Dynamics of Gaseous Ions. Feb. 22-28, 1997, Ventura CA. 2. The Fifth Workshop Consortium for Nanostructured Materials, Nashville, Tennessee, Oct. 17-19, 1996. 3. Joint APS/AAPT Meeting, April 17-21, 1997 Washington D.C

Metal-Ion Chemistry in Clusters Initiated by Ionization/Dissociation of Organometallic Precursors," presented at the 17th International Symposium on Molecular Beams, Paris, France, June 2, 1997 (Invited).

Non-Resonant Excess Photon Detachment of H- Ions. Presented at the 1996 Joint Meeting of Texas Section of APS, AAPT & Zone 13 of SPS, March 15-16, 1996

Excess Photon Detachment of H- Ions with 1.17 eV Photons. Presented at the 1996 Annual Meeting of DAMOP, May 15-18, 1996, Ann Arbor MI.

Excess Photon Detachment of Negative Hydrogen Ions. Contributed paper to the 1996 QELS Conference. Anaheim, CA, June 2-7, 1996.

Airborne Mercury Detection by Resonant UV Laser Pumping Presented at Connecticut Microelectronics and Optoelectronics Symposium, Storrs, Connecticut, 1996.

Full and Half-Collision Studies of Metal Atom Singlet -to Triplet Deactivation Induced by Rare Gas Atoms. Presented at the Annual Meeting of the Optical Society of America and XIth Interdisciplinary Laser Science Conference. Portland, OR, Sept. 1995.
Presented at the annual meeting of the National Society of Black Physicists, April 12-15, 1995 Atlanta GA.

Spectroscopy, Energy Transfer, and Dynamics in Metal atom- rare gas system and Metal-Hydrogen Systems. Colloquium presented at the Departments of Physics of Clemson University (Nov. 1993) and University of North Carolina in Greensboro (April 1994)

Potential energy Curves of M (Na²p). RG (²Tl) excited state and M+. RG ground states (M=Li, Na; RG=He, Ne. Presented at the Annual Meeting of the Optical Society of America and the XTh Interdisciplinary Laser Science Conference, Dallas, Texas, Oct. 1994.

Alignment effects in the Reaction of Na (4p) +H₂. Presented at the Seventh Interdisciplinary Laser Science Conference, Monterey, California, 1991

Reaction Dynamics of Na (4p) + H₂. Presented at the 10th International Conference on Spectral Line Shapes, Austin, Texas, 1990.

2-G. Funded proposals (as PI)

Proposal title	Funding agency	Amount funded	duration
Ab Initio Studies of Metal-Rare Gas and Metal-Hydrogen Interaction Potentials	NSF Program 1954: Quantum Calculations	\$137,628.00	09/01/96-08/31/99
Effects of Electronic Orbital Alignment in Laser Induced Metal-H ₂ and Metal-CH ₄	NSF-CAREER	\$359,465 PLUS Supplement; \$14,000	3/1/98-02/28/02
ITR/ Computational Geometry for Structural Biology and Bioinformatics	NSF-ITR /Duke University	\$524,874	9/15/00-8/31/05
Quenching of excited states of lithium by H ₂ ,D ₂ ,N ₂ , and alkane and alkene hydrocarbons: Kinetics and Dynamics	NSF-Chemistry	\$285,738	3/1/02-2/28/05
The A&T Physics Scholars Program - An On-Track Feeder	Sloan Foundation	\$180,000	4/1/02-3-31-06
Acquisition of a multi-source reflection time-of-flight mass spectrometer	NSF-MRI	\$447,635	09/01/03-08/31/05
INTERNATIONAL COLLABORATION IN RESEARCH AND EDUCATION WITH ADDIS ABABA UNIVERSITY (ETHIOPIA	NSF-OISE	\$15,500.00	8/15/04-8/14/05
AfricaArray: Imaging the African Superplume, building African partnerships and enhancing diversity in the geosciences:	NSF-OISE-PIRE	\$635,600.00	1/06-12/11
The Sloan A&T Physics Scholars Program: Preparing undergraduates for a Ph.D. in the sciences.	Sloan Foundation	\$210,000.00	9/1/2005-8/31/2008
International Research in Earth, Atmospheric and Space Sciences in Ethiopia.	NSF-OISE-IRES	\$149,000	1/1/07-12/31/10
NOAA Interdisciplinary Scientific Environmental Technology (ISET) Cooperative Research and Education Center”	NOAA-EPP	\$12.5 Million	9/ 1/06 –8/31/11
Kinetics and Thermochemistry Studies of Carboxylic and Other Acids Using Negative Ion Proton Transfer Mass Spectrometry (NI-PTRMS)	NSF-Atmospheric Chemi	\$330,000	6/1/08-5-31-11
Collaborative Research: Track 2 - Enhancing Diversity in the Geosciences through the Africa Array (AA) Educational Alliance	NSF-Geosciences	671,500	9/1/09-8/31/14
Laboratory determination of optical properties of aerosols using cavity ring down spectroscopic technique	DoD	\$575,000	5/1/11-4/30/14
Enhancing Earth System Science Education in Guilford County Schools Central Region Secondary Schools (Co-PI)	NASA	\$408,391	5/2010-4/2012
Effective Global Climate Change Education and Research for Minorities (CO-PI)	NASA	\$658,903	2011-2013

FOR LISTING OF ALL PROPOSALS SUBMITTED AND PENDING PROPOSALS SEE APPENDIX 1

3. DETAILS OF PROFESSIONAL EXPERIENCE - TEACHING

3-A. Summary of contributions to education: 1993-2006

Number of courses taught	Graduate: 7, Undergraduate 8
Number of new courses developed	22 (already in catalogue) 4 others
Contributions to new degree programs and concentrations	4-(physics), 4 interdisciplinary programs
Number of graduate students advised	13
Number of undergraduate students advised (research advising)	18
Number of postdoctoral fellows supervised	6

3-B. Courses taught

1. Undergraduate courses taught include

Laser Electronics,
 Special Topics
 College Physics I
 General Physics I and II
 Quantum Mechanics I and II
 Mathematical Physics
 Physics Orientation
 Electromagnetism
 Atomic and molecular physics

2. Graduate courses taught include

Classical Mechanics: PHYS. 600
 Statistical Mechanics: PHYS. 630
 Atomic and Molecular Physics: PHYS 735.
 Quantum Mechanics II and I. PHYS 620/720
 Spectroscopic techniques PHYS 736
 Chemical and Physical processes in the Atmosphere EES 750
 Graduate Research and Thesis: PHYS 770, PHYS 791/792

3-C. Student advising

This list doesn't include all the students supported by the NOAA-ISET Center. This is a list of students supported by Research funding – all through single investigator awards given to Bililign

Name	Level	Date of graduation	Thesis Title/Project	Current address
Ben McCarter (African American)	Graduate (MS)	1999	Laser-Induced Organometallic Chemistry Within Clusters	Corning
Tito Robinson (African American)	Graduate (MS)	2000	Electronic Orbital Alignment Effects in the reaction of Li (2p) + H ₂	Kodak
Brian Hattaway (Caucasian)	Graduate (MS)	2003	Energy Transfer in Li(3p) + Ar, H ₂ and CH ₄ Collisions	University of Connecticut
James Tucker Swindel II (African American)	Graduate (MS)	2003	Quenching of Excited States of Lithium by Alkane and Alkene Hydrocarbons.	PhD, working for Army Lab
Niel Crews (Caucasian)	Graduate	Left after 1 year (1999)	Set up the lab	Missionary
Barker A Barker (African)	Graduate	Left in 2001	Project: Energy transfer in Li(4p)-H ₂ collisions	School Teacher

Kevin Wedderburn (Jamaica)	Graduate (MS)	Summer 2004	Quantum Chemistry	PhD student
Vivek Komaiagiri (India)	Graduate (MS)	Summer 2005	Li(np)-Alkane, Alkene collisions	Employed
Ibrahima Mbaye African	Undergraduate	2002-2003	Li(3p)-CH ₄ , C ₃ H ₈ , C ₂ H ₆ , Ar quenching cross sections	
Larkish Perry African American F	Undergraduate	2002-2003	Li(3p)-CH ₄ , C ₃ H ₈ , C ₂ H ₆ , Ar quenching cross sections	
Ekkizogloy Luke Caucasian	Highschool senior (NASA Sharp)	Summer 1999	Participated in the set up of the laboratory	CALTECH
Champing Kwadowa African	High school senior (NASA Sharp)	Summer 2000	Life time of excited states of Li	North West University
Wandyliis Vergas Hispanic F	High school senior (NASA Sharp)	Summer 2002	Quenching cross sections of Li(3p) by H ₂ , and CH ₄	University of Porto Rico
John Brown African American	High school teacher	Summer 1999	Li(2p)-H ₂ reactions	Guilford County Schools
Derje Seifu African-American	Professor of Physics	Summer 1999	Spectral line shape calculations, programming	Morgan State University
Solomon Tadesse African American	Graduate (Chemistry)	Summer 1998		School Teacher
Michael Kutz Caucasian	Undergraduate	Summer 1999	Computer software	TransTech Pharma
Natnael Semmeneh Ethiopian	Graduate	Graduated 2005	Li(4p)-CH ₄ , C ₃ H ₈ , C ₂ H ₆ , Ar quenching cross sections	Vanderbilt
Brandon Davis African American	Undergraduate	Current	Geophysics	
Dereje Worku Ethiopian-American	Undergraduate	Current	Quenching of Li(4p)	
Jesse Fox Caucasian	Undergraduate	Current	Geophysics	
Martin Jones Caucasian	Undergraduate	Current	Kinetics modeling	
Michael Pearson, Abebaw Belay	Undergraduates	2007	International experience in Ethiopia/Africa Array-SA	
Anthony Cochran	PhD (EES)	Current	NI-PTMS	
Israel Begashaw	Graduate	Current	Cavity Enhanced Spectroscopy	
Chris Ware	Undergraduate	current	Cavity Enhanced Spectroscopy	
J. Jefferies	Undergraduate	current		
C. Melvin	Undergraduate	current		
Chris Jessamy	Graduate	Current	Cavity Enhanced Spectroscopy	
Malikah Greene	Undergraduate	Current	Mass spectrometry	
Stefan Boskovic	Undergraduate	Current	Cavity enhanced Spectroscopy	
Sujeeta Singh	PhD(EES)	Curent	Aerosol Optical Depth	

3-D. Contributions to course and curriculum development

- ◆ Defined the contents of the courses on *Atomic, Molecular and Laser Physics* both for the undergraduate and graduate level. This course was again improved and named *The Physics of Atoms, Molecules and Nanosystems* and was offered for the first time in 2005.
- ◆ Introduced a new graduate course: Spectroscopic techniques. Revised the course content of quantum physics.
- ◆ Led the team and wrote the proposal to develop a course for University Studies entitled "Scientific Revolutions and Social Change"

- ◆ Contributed to the proposal to establish MS program in Physics
- ◆ Led a complete revision of the physics curriculum including the creation of new concentrations in Geophysics, Space Science, and Engineering Physics for ABET accreditation.
- ◆ With Dr. Tang, and others initiated the effort to establish the computational sciences program in Arts and Sciences and worked with the University Committee to establish the Computational Sciences and Engineering MS program.
- ◆ Worked with Dr. Uzochuku and others to draft the request for authorization to establish the PhD program in Energy and Environmental studies, and contributed 4 courses to this program.
- ◆ Led the revision of the MS program in Physics
- ◆ Represented the college of Arts and Sciences in the committee that led the effort to establish interdisciplinary Ph.D. programs with Engineering.
- ◆ Led the effort to establish the BS degree in Atmospheric Sciences and Meteorology
- ◆ Played active role in the creation of the Joint School of Nanoscience

4. WORKSHOPS, SHORT COURSES AND PROFESSIONAL SERVICES

4-A. Summer research activities

2006/07/09- Travelled to Addis Ababa University with Students on International Research Collaborations

2005: Attended the NATO Advanced Study Institute, International School of Atomic and Molecular Spectroscopy: 22nd Course: New developments in Optics and Related Fields
Location: Ettore Majorana Center for Scientific Culture Erice, Sicily, ITALY: June 6-21, 2005

2003: Visiting Professor, University of Marseilles, France

2000-2001: Visiting Fellow, JILA (Joint Laboratory for astrophysics), University of Colorado/NIST Boulder Colorado.

Summer 1997: NRC/HBCU Faculty fellow, Oak Ridge National Laboratory

- *Research in metal clusters.*

Summer 1996: NRC/HBCU Faculty fellow, Oak Ridge National Laboratory

- *Research in metal clusters.*

Summer 1995: AWU/DOE Faculty Fellow: Los Alamos National Laboratory

-*Research in Experimental Atomic Physics.*

Summer 1995: Visiting Assistant Professor, University of Connecticut

-Research in Air-Borne Mercury Detection

Summer 1994: Visiting Assistant Professor, University of Utah

-Research in Theoretical Chemical Physics.

4-B. Workshops and conferences attended, and service to professional organizations

2010-2011

- Navy STEM Forum
- ORNL- Joint meeting of NOAA-CSC directors and ORNL leadership
- Organized a session “*The role of physics in atmospheric, ocean and earth sciences*” for the 77th Southeastern Section of the American Physical Society in Baton Rouge LA.
- Visited the University of Iowa, selected as Alumni fellow for the University of Iowa
- Organized and presided over the NOAA-NAC meeting-Fresno California, Nov 1-3
- Attended the NOAA Science Board meeting and Center Directors Meeting, Dec 1, 2010
- Attended the NOAA Center Directors Meeting and Round table meeting with Secretary of Commerce Gary Locke, March 23-25, 2010
- Attended the NSF PIRE PI’s meeting Feb. 14-16, 2010
- Served as a Panel member for NSF Chemical Instrumentation program, March 6-7

2009-2010

- Presentations made by Bililign at CAS Colloquium, April 2010 At the Triad Area CEO reception, Dec 2009, Division of research Researcher Appreciation day April 2010,
- Organized and presided on NOAA advisory Committee meeting, Nov. 10, 2010
- NOAA EPP forum, organizing committee member, Luncheon speaker, Nov 11-13, 2010
- Attended the NOAA EPP Center Directors meeting in Silver Spring MD, and visited NC senators in Capitol Hill on the ISETCSC progress. Sept 9-11
- Attended the OEDG –PI’s meeting at the American Institute of Research, Washington DC, Sept 24-26
- For the State Board of Education and the NC Dept. of Public Instruction, provided professional service a 1 day service July 22, to conduct the Physics Praxis II Standard Setting Study
- Organized 1 week Earth System Science for Educators workshop for 25 teachers (Jointly funded by NSF and NOAA funding).
- Organized a one week Summer camp for 21 high school students (jointly provided by NSF/NOAA funding)
- Organized Middle school camp in collaboration with The Greensboro Natural Science center.
- Attended a workshop on expanding the AfricaArray (<http://africaarray.psu.edu/about/default.asp>) network to support interdisciplinary and multidisciplinary science in Africa on **June 2-4, 2010** in Washington D.C. at Howard University.
- Visited NCAR, NOAA ESRL and University of Wyoming June 10 -11, 2010, and attendee collaboration meetings

2008-2009

- Organized and led the NOAA-Advisory Committee meeting in Raleigh Oct: 27-28 2008
- Attended Weekly phone meetings of the NSBP/NSHP organizing committee to organize the EPSS (Earth and Planetary System sciences session)
- Organized a session in Atmospheric sciences and Geophysics at the 75th SESAPS meeting.
- Attended the ISET thrust area II (Greesboro 8.8/08) and Thrust Area III (Minneapolis 8/11/08) meetings
- Attended summer student presentations of NOAA summer intern students (Maryland 7/31/08-8/1/08)
- Organized and facilitated with NOAA and IRIS the summer teachers Earth System science Institute attended by 25 high school teachers (150 applied)
- Organized the summer middle school (20 students) and high school weather camp (25 students)
- Completed the recruitment of 6 students to the graduate program. Four are enrolled, one differed and one pending (TOEFL-issues)
- Attended NOAA-CSC Directors meeting, Oct 2008, attended a meeting at NOAA-NCDC- November 08
- Led the organizational committee to form the Ethiopian Physics Society in North America, conducted a one day meeting at the American center for Physics (Aug 2/2008) and submitted an article for the News letter on Forum on International Physics.

2007-2008

- May 25, 2007: Visit to Capitol Hill, meeting with staffers of Senator Doll, Burr and Congressman Watt on NOAA-ISET.
- June 11: NOAA-ISET Thrust area I meeting, Presentation Title: Cavity Ring Down Spectroscopy.
- June 18: Meeting with NOAA scientists at Boulder, CO.
- June 13-14: Visit to Penn State, and presentation on NCAT geophysics program.
- July 14-Aug 4: Traveled to Ethiopia with three students: Report in Appendix *Presentation: Understanding Climate Change- Capstone Interdisciplinary Problem of the Century: Talk at AAU-Department of Physics, Ethiopia; July 2007.*
- Served as external examiner to five MS student thesis at Addis Ababa University.
- Organized and Chaired the Earth and Planetary System Science session at the National Society of Black Physicists and Hispanic Physicist in Washington DC.
- *Attended the NOAA-EPP Center directors meeting in Silver spring MD, Feb. 27-29-2008, and Briefed the North Carolina Senators (Dole and burr) and Congressmen (Watt and Price) on the accomplishments of NOAA-ISET Center.*
- *Attended the NOAA-EPP Center directors meeting in Silver spring MD, Oct, 2007*

2006-2007

- Attended the APS, Physics Chairs Meeting; Maryland, June 8-11 2006
- Served at NIH Panel, NIH, June 20-22, 2006.
- Attended NOAA-ESRL dedication ceremony at Boulder Colorado, Aug 21-23
- Organized and Chaired the Earth and Planetary System Science session at the National Society of Black Physicists and Hispanic Physicist in Boston MS.
- Visited Ethiopia with **Dr. Jemberie** and Addis Ababa University: July 20-Aug. 9, as part of NSF funded planning grant to develop research collaboration in geophysics and theoretical physics. Gave a talk entitled "*Photochemistry and Mass Spectroscopy of Small Clusters*". The talk was attended by over sixty faculty and students at Addis Ababa University. *Attended the NOAA-EPP Center directors meeting in Silver spring MD, March 17-20, 2007***2005-2006**
- NATO Advanced Institute, The 22nd Course of the International School of Atomic and Molecular Spectroscopy Erice, Sicily, Italy June 5-21, 2005.
- Industrial Physics Forum, AIP/NIST, Maryland. Nov. 6-9, 2005
- E-course meeting, Penn State, PA, Oct 17, 2005
- Reviewer for Chem. Phys, and Journal of Physical Chemistry
- Attended the SURA –MI meeting. (August 2005)

2004-2005

- Attended the National Institute of Aeronautics Fellows meeting, Langley, VA
- Attended the Sub Saharan Africa Workshop at the National science Foundation, January 2005.
- Attended the APS Physics Chairs Conference, MD
- Attended the 71st Annual Southeastern Section meeting of the American Physical Society, Oak Ridge, TN,
- Attended the Triangle Biophysics Symposium, Nov. 2004

2003-2004

- Attended the Grid Computing Workshop, UNC Chapel Hill, Oct. 28-29 2003.
- Attended the ITR Biogeometry group meeting Nov 17-18, Duke University (2003)
- Made a presentation at Livingston College, Salisbury, NC. Nov 14, 2003.
- Gave a colloquium: Title of the talk "Physical and Chemical quenching of Li (3p) by several gases." Morgan State.
- Made a presentation at DOR, NCA&T, for the NSF guest Dr. Thomas Windham, March 22. Title of talk "Laser Spectroscopy, Nanoclusters and Nanoalloys"
- Attended the weekly meetings of the CES committee.
- Served on the University Computational Engineering and Science Committee.
- Edited two chapters of the book "Physics: Principles and Problems for McGraw Hill.
- Reviewed three chapters of the book "A *Comprehensive Introduction to Quantum Mechanics*" by Robert Scherrer, Ohio State University, for Addison –Wesley.
- Attended the planning committee of HBCU-UP conference.
- Attended the organizing committee of Sloan Foundation Conference.
- Attended the Proposal Review Panel: NSF, Feb 4-7, 2004

2002-2003

- Consultant: QEM: HBCU –UP Multi-year Grant Proposal Development Workshop
- Served at NSF panel
- Attended the Triangle Biophysics Symposium
- Attended a workshop "Leveraging Innovations at our UNC Campuses" sponsored by UNC office of the President and the National Science Foundation. February 27, 2003
- Attended the Spectroscopy Celebration Workshop, University of Connecticut, Nov. 9, 2002

2001-2002

- Attended workshop at NC Supercomputer Center: Title of Workshop: " Gaussian: Theory and Practice" Oct 9-12, 2001.
- Attended a two-day training on IBM SP at North Carolina Super Computer Center.
- Attended the QEM/NSF sponsored workshop on MRI ("Major Research Instrumentation") in Atlanta, GA November 9-10, 2001.
- Served in the NSF Panel on Bio Multi-User Equipment Program, at NSF January 30-Feb. 1, 2002 In Arlington, VA.
- Attended the American Physical Society Division of Atomic and Molecular Physics Conference, May 29-June 1, 2002, Williamsburg, VA
- Attended Molecular Dynamics work shop, Cooper Mountains, CO

2000-2001

- Attended the Triangle Biophysics Symposium " Macromolecular Interactions, Emerging Concepts and Technologies" Oct 19-21, Durham North Carolina.
- Attended a workshop organized by the National Biotechnology Information Facility entitled " Bioinformatics: Merging Biology and Computer Science" Oct. 16-18, 2000, Greensboro, NC.
- Participated in the meetings of the NC Genomic and Bioinformatics consortium meetings.
-

1999-2000

- 66 SESAPS meeting, Nov 7-9, 1999 Chapel Hill, NC
- Gordon Research Conferences on Clusters, Nanocrystals and Nanostructures, Connecticut College.
- American Chemical Society Southeast Regional meeting, Knoxville, TN Oct. 17-20, 1999.
- LS-NCAMP Undergraduate Conference, Winston Salem State University, Feb. 2000.
- APS-DAMOP: 2000, University of Connecticut, Storrs, Connecticut, May 2000.

1998-1999

- APS (American Physical Society Meeting) march 1999, Atlanta, GA
- American Chemical Society regional meeting, Nov. 4-7, RTP, NC 1998

1997-1998

- NCAMP Conference, Charlotte, NC, April 1998.
- Free-Electron Laser, workshop, Newport News VA, 1998

1996-97

- Fourth Winter Gordon Research Conference on Structures, Energetics and Dynamics of Gaseous Ions. Feb. 22-28, 1997, Ventura CA.
- The Fifth Workshop Consortium for nanostructured Materials, Nashville, Tennessee, Oct. 17-19, 1996
- Joint APS/AAPT Meeting, April 17-21, 1997 Washington D.C
- Second Annual Life and Physical Sciences Symposium, NCA&T, Feb. 21, 1997

1995-96

- Workshop on Material Science for Historically Black Colleges and Universities in the Southeastern United States, Oak Ridge, Tennessee, October 13-14 1995
- Workshop on CW All-Optical Multiple Resonance Spectroscopy, June 16-17, 1995 University of Connecticut Laser Facility, Storrs, Connecticut.
- Workshop on Teaching Large Classes, Feb. 10, 1996, The Friday Center, Chapel Hill, North Carolina
- College of Arts and Sciences Grantsmanship Workshop, Dudley Cosmetology University, Feb. 17, 1996.
- The First Annual Life and Physical Science Research Symposium. NCA&T, Feb 23, 1996.

1994-95.

- Annual Meeting of The Optical Society of America and the Xth Interdisciplinary Laser Science Conference, Dallas, Texas, Oct. 1994.
- Annual meeting of the National Society of Black Physicists, April 12-15, 1995 Atlanta GA.
- HBCU Workshop on the Physics of Materials and Materials Science, Washington D.C. October 13-15, 1994
- NCAMP Faculty Forum, Oct. 1994, University of Texas- Austin.

5. SERVICE TO THE UNIVERSITY AND COMMUNITY

CURRENT: Director, NOAA-ISET Center.

The Center is on its second year of a five year funding cycle.

5-A. Major accomplishments as Department Chair

- *Led the complete revision of the physics program (BS and MS): this includes creation of new, courses and new degree concentrations in geophysics, space science interdisciplinary physics and engineering physics for ABET accreditation.*
- *Led aggressive recruitment campaign: contacting local schools, offering lectures on careers in physics, interacting with schoolteachers. The enrollment and graduation rates have shown a modest increase. (From 27 undergraduate majors to 37 undergraduate majors and 5 double majors)*
- *Obtained Sloan foundation grant for student scholarship.*
- *The Department of Physics is a major player in all interdisciplinary degree programs: Energy and environment, computational sciences and engineering and the biotechnology program. The Department contributed new courses to these programs.*
- *Developed faculty student mentor –Mentored teams to ensure student success and retention.*
- *Invited prominent and notable speakers to the department: 2001 Nobel prize winner in physics (Carl Weiman) Prof. Eric Mazur of Harvard, prof. Gwang-Hi Jeung (France), Prof Carl Linberger, Colorado to mention a few.*
- *Provided summer research opportunities to more than 60% of majors through collaborators.*
- *Increased research productivity in the Department: the department has more than 60% of the active funded projects in the college of Arts and Sciences and the only NSF-Major Research Instrumentation, and NSF Career award in the University*
- *Increased the visibility of the department by producing the first brochure and improved web site.*
- *Created the Physics Alumni advisory board and scholarship fund.*
- *Established a computational facility in the Department of Physics.*
- *Developed strong partnerships including the one with SURA (Southern Universities research Association)*
- *Established a seismology lab in the department of Physics.*
- *Developed research collaborations with several universities in the US and International collaborations in Europe and Africa. Two visiting professors from Ethiopia visited the department and Four NCA&T Physics majors will spend five weeks in South Africa in 2006 summer.*
- *Two NCA&T students spent three weeks in Marseilles France studying quantum chemistry.*
- *Conducted active research, published papers, acquired grants, supervised graduate student thesis, and taught several courses while performing administrative duties.*
- *Led collaborative educational research efforts to improve retention and success of African American Students in STEM areas.*
- *Mentored high school students during the summer and run the one-week PHYSICS SUMMER CAMP for 5th grade students in the Department.*
- *Awarded the Outstanding Researcher award and Teacher of the Year Awards while serving as a Department Chair.*

5-B. Service to the Department

- *Graduate Coordinator: 1998-2001, 2006-present*
- *MS proposal Committee 1996-1997*
- *Student Advisory Committee: 1995-96*
- *Phys. 241 coordination Committee (1995-1998)*
- *Colloquium organizer 1995-96, 1996-97*
- *Library Liaison : 1993-94, 1994-95, 1995-96*
- *Examination Review Committee. (1997-1999)*
- *Peer reviewer, spring 1996.*

5-C. Service to the College (Arts and Sciences)

- *Member of search committee (Physics department chair) Spring 1995*
- *Acting Chairperson of the Physics Department. Spring 1997*
- *Support Personnel: The first and Second Annual Life and Physical Sciences Symposium. (Introduce speakers, preside meetings.)*
- *Member of Organizing Committee, NSBP, National Society of Black Physicists, 2000.*
- *Organizer of the Symposium “Advances in Atomic, Molecular and Optical Physics”, NSBP 2000*
- *Member of the Editorial Board, College of Arts and Sciences Newsletter. (2000-2001)*
- *Chair, Chemistry Chairperson Search Committee (2002)*
- *Member of the College planning committee for M.S. degree program in computational Sciences.*

5-D. Service to the University

- *Member of the University Senate (representing the department) (1996-2000).*
- *Member of the Educational Policy Committee of the Senate. (1996-2000).*
- *Member of the research and development advisory committee of North Carolina Genomics and Bioinformatics Consortium.*
- *Member of the Interdisciplinary PhD planning committee: Program: Energy and Environmental Studies.*
- *Member of the FUTURES VENTURE SEED GRANT, task force (2002)*
- *Member of the Computational Sciences and Engineering program-developing committee.*
- *Abstract reviewer for HBCU-UP undergraduate student conference.*
- *University Graduate Council member (2000-Present)*
- *University Teachers Education Council member (2001-present)*
- *University Research Council member (2004- present)*
- *Member of the Joint school of nanoscience committee.*
- *Member of the University committee to develop University Reassign time policy*
- ***Co-Leader, Research thrust area in Nanostructured Materials Research (2004-Present)***
- ***Member of Task force on NCA&T Sabbatical Policy: wrote the policy***
- *Member of University Commission on Campus Intellectual Life*
- *Search Committee: University Studies Dean.*
- *Search Committee member: Vice Chancellor for Human resources*
- *Member of the University tenure promotion and reappointment committee*
- ***Chair and member of the Global Warming Task Force (2008)***
- *Member of the UNC-Tomorrow 21st century skills(2008)*
- *Member of search committee for the deans of College of Arts and Sciences and Engineering*
- *Strategic Planning Committee- Sub Committee on Research*
- *Chair, University Research Award Committee*
- *Steering Committee of the **Enhancing Bioscience and Engineering Education (EBEE)** through curriculum integration and research experiences.*
- *Committee on Developing STEM Early College at NCA&T*
- *Member of the search Committee for Dean of the college of Arts and Sciences, and College of Engineering.*

5-E. Service to the Community

- *Organized summer weather camp for middle and high school students through NOAA-ISET Center (summer 07, 08,09,10), Teachers workshop with NOAA and IRES (2006,2007, and 2008)*
- *Founder and Chair of the organizing Committee of the Ethiopian Physics Society in North America*
- *Visited several high schools in Greensboro and in North Carolina and gave a 1 hour lecture to two groups of 45 students on the career opportunities in physics and the physics department at A&T. Flyers and brochures were distributed (2004,2005,2006)*
- *Organized a one-week summer PHYSICS CAMP for 15 5th grade kids*
- *Served as a science fair judge at General Greene Science and Technology School (2002,2004,2006)*
- *Participated at the University Open House in Washington DC, Dec. 2001.*
- *Participated in a CAREER FAIR at Northeast High School on Oct 30, 2001.*

Dr. Solomon Bililign

Vitae, 2011

- *Public lecture on Lasers for public scientific literacy (CIVITAN CLUB of GREENSBORO) 1999.*
- *Science demonstration on optics to third grade students at Sommerfield Elementary School March 26/1997.*
- *Participated at the Science Extravaganza at Guilford Middle School. April 17, 1997.*
- *Voluntary service at the Greensboro Urban Ministries, and Participant of the Crop Walk 97.*

6. CITATIONS

The following are excerpts from letters from colleagues, coworkers university and government officials

“The allocation committee awarded Dr. Solomon Billing high performance computing resources... the allocation of resources to a faculty member by the Academic Allocations Committee is a clear testimony to the quality of contributions which they are making to your university.” **Dr. John H. Harrison, IV: Vice President, High Performance Computing(1996).**

“I appreciate all you do to encourage the continuing studies of America’s youth.” **Margaret Spellings, Secretary of Education, 2006.**

“Once again, you have brought distinction to the University” **Dr. Carolyn Meyers, Provost, NCA&T (2001)**
“Congratulations on your recent NSF Partnership for International Research and education Award. Considering the competition, that is quite a feat! But knowing you as I do, it’s a piece of cake.” **Dr. Carolyn Meyers, Provost NCA&T (2005)**

“Your solid work continues to make a difference. I am very proud of your contributions.” **Dr. James C. Renick, Chancellor, NCA&T (2003)**

“Bililign’s work on the experimental study of gas-phase metal-hydrogen reaction dynamics using laser pump-probe technique led to significant new insight into alkali metal-atom-hydrogen reaction dynamics. His work on the spin-orbit predissociation dynamics of metal-rare gas van der Waals molecules has led to important breakthroughs in understanding of this class of processes.” **Professor Paul D. Kleiber: Director, Optical Science and Technology Center, University of Iowa.**

“Solomon was able to draw on his considerable experimental expertise from his own previous research at the University of Iowa, Utah and Los Alamos. He quickly mastered the apparatus and with the help of a graduate student was able to generate and interpret an immense quantity of data.” **Dr. John Miller: Head: Biochemistry and Biophysics Section, ORNL.**

“Bililign has been awarded a highly competitive JILA Visiting Fellowship for next year at the University of Colorado, as evidence of the significance of his research efforts.” **Prof. W. C. Stwalley: Head, Department of Physics, University of Connecticut.**

“Bililign started a very respectful research program at the department by building a laser lab for chemical physics research. He obtained the necessary funds, designed the layout and commissioned a state-of-the-art research facility that is comparable by all standards to similar facilities at distinguished research and academic institutions.” **Dr. R. Sawafta: Director of Technology & Automation, TransTech Pharma.**

“As a teacher he is regarded with the highest opinion among my peers and myself. His class often proved to be the most challenging while the most rewarding. His method of evaluation is fair and his expectations are poised just above the level that which his students perform, not to daunt or belittle, rather to motivate and encourage.” **Former Student**

“Every day that I arrive to work, I feel his presence looking over my shoulder ensuring that I maintain the standard of excellence he has set forth for everyone lucky enough to come in contact with him.” **Dr. Vernon Simmons-Former Student**

“Dr. Bililign’s peers have judged his research to be of the highest quality in two ways: by publications of his research results in prestigious reviewed journals and by continued funding of his research program. NCA&T has a research gem in Dr. Bililign.” **Dr. Thomas Sandin: Professor of Physics NCA&T.**

“Dr. Bililign played a major role in the establishment of the recently established Master of Science degree program, and enriched the graduate and undergraduate curricula with laser physics and spectroscopy courses.” **Dr. Caesar Jackson: Interim Dean, college of Arts and Sciences, NCA&T.**

“ Through time Bililign contributed a lot to the development of physics education and research in Ethiopia and abroad.” **Editor: Newsletter of the Ethiopian Physical Society.**

“My impression of Prof. Bililign is of a knowledgeable teacher, a committed researcher and a compassionate person”
Former Student

“Because of you this degree has real value” **Former Student**

“I personally want to thank you so much for your help and encouragement through the years at NC A&T and beyond! My training in the Physics Department under your leadership has provided me with the foundation needed to grow!”
Jasmine Davenport Crenshaw, Former student

“Thanks a lot for the excellent document that you developed at short notice. Your leadership and professionalism are much appreciated. Solomon, a special thanks to you for leading this effort” **Dr.N. Radhakrishnan**
Vice Chancellor for Research & Economic Development

A parent of a former student:

I am sincerely grateful to you and all of the professors in the Physics' Department of our beloved North Carolina Agricultural and Technical State University, who equipped my daughter, Lynnae Cennette Quick (May 2005) so richly for her career. I remain indebted to all of you!

Former Student

*I want to send a small note to say hi and I hope that things are good for you. I now work in the cellular transceiver industry for Fujitsu. My group is a small R&D organization that has produced world class technology. I manage the greater China region for business and technical advancement. **By the way, thank you for the rigorous Quantum instruction***

REFERENCES

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APPENDIX 1: Proposals submitted since 1996

Submitted	Prop No.	Project Name	Sponsor	Deadline	Role	Status			
03/17/2011	11-0371	Climate Change Education	NASA-NASA HEADQUARTERS -FAR-FEDERAL ACQUISITION REGULATION	03/18/2011	Principal Investigator	Proposal Approved	Copy		
11/01/2010	11-0176	INTERDISCIPLINARY SCIENTIFIC ENVIRONMENTAL TECHNOLOGY	DOC-NGS-NOAA-OAR-OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH-EPP-EDUCATIONAL PARTNERSHIP PROGRAM	11/15/2010	Owner	Proposal Approved	Copy		
07/25/2010	11-0023	Optical properties of Aerosols	DOD-ARMY-ARL-ARO-ARMY RESEARCH OFFICE	08/06/2010	Owner	Proposal Approved	Copy		
03/09/2010	10-0355	Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM)	NSF-NATIONAL SCIENCE FOUNDATION	03/23/2010	Owner	Proposal Approved	Copy		
09/20/2009	10-0116	NASA K-12 CAN	GUILFORD COUNTY SCHOOLS	09/25/2009	Investigator	Funded	Copy		
09/14/2009	10-0099	Interdisciplinary Graduate Program Scholarships	NSF-NATIONAL SCIENCE FOUNDATION	09/14/2009	Principal Investigator	Withdrawn	Copy		
08/27/2009	10-0077	US-Ethiopia collaboration	NSF-NATIONAL SCIENCE FOUNDATION	09/15/2009	Owner	Proposal Approved	Copy		
08/07/2009	10-0025	NIST Construction Grant	DOC-NIST-NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY	08/10/2009	Lead Principal Investigator	Not Funded	Copy		
05/07/2009	09-0456	Kinetics and Thermochemistry Studies of Carboxylic and Other Acids Using Negative Ion Proton Transfer Mass Spectrometry (NI-PTMS)	NSF-NATIONAL SCIENCE FOUNDATION	05/12/2009	Owner	Proposal Approved	Copy		
04/30/2009	09-0442	PIRE: Africa array: Imaging the African Superplume, Building Partnership and Enhancing diversity in geosciences	PENNSYLVANIA STATE UNIVERSITY	05/04/2009	Owner	Proposal Approved	Copy		
04/13/2009	09-0385	The Anthropocene Science Center	PENNSYLVANIA STATE UNIVERSITY	04/17/2009	Owner	Not Funded	Copy		
12/04/2008	09-0202	Opportunities for Enhancing Diversity in the Geosciences (OEDG)	NSF-NATIONAL SCIENCE FOUNDATION	12/11/2008	Owner	Funded	Copy		
10/23/2008	09-0155	NASA GCCE	NASA-NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	10/24/2008	Investigator	Proposal Approved	Copy		
06/25/2008	08-0272	OISE - International Plan & Workshops	NSF-NATIONAL SCIENCE FOUNDATION	05/20/2008	Lead Principal Investigator	Proposal Approved	Copy		
		Kinetics and Thermochemistry Studies of Carboxylic							

10/17/2007	08-0078	and Other Acides Using Negative Ion Proton Transfer Mass Spectrometry (NI- PTMS)	NATIONAL SCIENCE FOUNDATION]	10/17/2007	Owner	Funded	Copy	
04/30/2007	07-0291	ERC: INTEGRATED REMOTE IN SITU SENSING SYSTEM (IRISS)	UNIVERSITY OF COLORADO	05/03/2007	Owner	Proposal Approved	Copy	
07/17/2006	07-0017	CLUSTER PHOTOCHEMISTRY; FORMATION, INTRACLUSTER REACTIONS AND FRAGMENTATION DYNAMICS WITH APPLICATIONS TO CATALYSIS	NATIONAL SCIENCE FOUNDATION]		Owner	Not Funded	Copy	
03/01/2006	06-0261	EDUCATION RESEARCH: IDENTIFYING MODELS THAT WORK IN INCREASING STEM GRADUATES AT HBCU'S	NSF-NATIONAL SCIENCE FOUNDATION	02/28/2006	Owner	Proposal Approved	Copy	
02/01/2006	06-0231	(IRES): INTERNATIONAL RESEARCH IN EARTH, ATMOSPHERIC AND SPACE SCIENCES IN ETHIOPIA	NSF-NATIONAL SCIENCE FOUNDATION	02/15/2006	Owner	Funded	Copy	
10/14/2005	06-0115	EPP 2006: NOAA INTERDISCIPLINARY SCIENTIFIC ENVIRONMENTAL TECHNOLOGY (ISET) COOPERATIVE RESEARCH AND EDUCATION CENTER	NOAA/OAR/EPP	10/17/2005	Lead Principal Investigator	Funded	Copy	
07/21/2005	06-0024	THE SLOAN A&T PHYSICS SCHOLARS PROGRAM PREPARING UNDERGRADUATES FOR A PH.D IN THE SCIENCES	THE ALFRED P. SLOAN FOUNDATION	08/01/2005	Owner	Funded	Copy	
07/14/2005	06-0013	GAS-PHASE STUDIES OF NANOCLUSTER PHOTOCHEMISTRY, NANOCATLYSIS AND NANOALLOYS	NATIONAL SCIENCE FOUNDATION		Owner	Not Funded	Copy	
07/11/2005	06-0008	ENERGY TRANSFER INTERMETALLIC VAPOR MIXTURE AND SPECTROSCOPY OF BOUND INTERMETALLIC EXCIMERS	NATIONAL SCIENCE FOUNDATION	07/11/2005	Owner	Not Funded	Copy	
03/04/2005	05-0255	AFRICANARRAY: IMAGING THE AFRICAN SUPERPLUME, BUILDING AFRICAN PARTNERSHIP AND ENHANCING DIVERSITY IN THE GEOSCIENCES	PENNSYLVANIA STATE UNIVERSITY	03/10/2005	Owner	Funded	Copy	

07/21/2004	05-0014	PHOTOCHEMISTRY WITHIN NANOCCLUSERS: INVESTIGATION INTO THE FORMATION, STRUCTURE, AND REACTIVITY OF GAS-PHASE METAL CLUSTER IONS AND NANOALLOYS	NATIONAL SCIENCE FOUNDATION	07/21/2004	Owner	Not Funded	Copy	
01/30/2004	04-0240	INTERNATIONAL COLLABORATION IN RESEARCH AND EDUCATION WITH ADDIS ABABA UNIVERSITY (ETHOPIA)	NATIONAL SCIENCE FOUNDATION		Owner	Funded	Copy	
02/04/2003	03-0262	QUENCHING OF EXCITED STATES OF LITHIUM BY H ₂ , D ₂ , N ₂ AND ALKNE AND ALKENE HYDROCARBONS: KINETICS AND DYNAMICS	NATIONAL SCIENCE FOUNDATION	01/23/2003	Owner	Funded	Copy	
01/10/2003	03-0203	ACQUISITION OF A MULTI SOURCE REFLECTRON TIME OF FLIGHT MASS SPECTROMETER	NATIONAL SCIENCE FOUNDATION	01/23/2003	Owner	Funded	Copy	
07/20/2001	02-0029	NANOCHEMISTRY: STUDY OF SIZE DEPENDENT CHEMICAL REACTIONS WITHIN CLUSTERS	AIR FORCE	08/23/2001	Owner	Not Funded	Copy	
07/18/2001	02-0028	NANOCHEMISTRY STUDY OF SIZE DEPENDENT CHEMICAL REACTIONS WITHIN CLUSTERS	DEPARTMENT OF ENERGY	08/23/2001	Owner	Proposal Approved	Copy	
07/02/2001	02-0002	QUENCHING OF EXCITED STATES OF LITHIUM BY H ₂ , D ₂ , N ₂ AND ALKANE AND ALKENE HYDROCARBONS: KINETICS AND DYNAMICS	NATIONAL SCIENCE FOUNDATION		Owner	Funded	Copy	
06/09/2000	00-0340	US FRENCH COLLABORATION IN EXPERIMENTAL AND THEORETICAL STUDY OF THE LI + H ₂ AND LI + CH ₄ COLLISIONS	NATIONAL SCIENCE FOUNDATION		Owner	Withdrawn	Copy	
04/07/2000	00-0279	ITR/COMPUTATIONAL GEOMETRY FOR STRUCTURAL BIOLOGY AND BIOINFORMATICS	DUKE UNIVERSITY		Owner	Funded	Copy	
02/04/2000	00-0195	NANOCHEMISTRY: STUDY OF CHEMICAL REACTIONS AND SIZE DEPENDENT CATALYSIS WITHIN CLUSTERS	US DEPARTMENT OF ENERGY		Owner	Not Funded	Copy	

04/15/1999	99-0239	SUPPLEMENT TO NSF AWARD #9733744	NATIONAL SCIENCE FOUNDATION		Owner	Funded	Copy	
12/09/1998	99-0117	THEORETICAL STUDIES OF THE INTERACTION OF METAL AND METAL CLUSTERS WITH SMALL MOLECULES	NATIONAL SCIENCE FOUNDATION	01/01/1999	Owner	Proposal Approved	Copy	
02/12/1998	98-0190	SIZE DEPENDENT CHEMISTRY WITH NANOCCLUSERS	UNIVERSITY OF TENNESSEE	02/12/1998	Owner	Not Funded	Copy	
02/10/1998	98-0187	HIGH ENERGY DENSITY METASTABLE MATERIALS	UNIVERSITY OF CONNECTICUT	02/10/1998	Owner	Not Funded	Copy	
10/28/1997	98-0088	A PROPOSAL TO ESTABLISH A LASER FACILITY FOR MATERIALS RESEARCH	DOD-ARMY/ARO	10/30/1997	Owner	Not Funded	Copy	
07/22/1997	98-0008	EFFECTS OF ELECTRONICS ORBITAL ALIGNMENT IN LASER INDUCED METAL-H2 AND METAL-CH4 REACTIONS	US DEPT OF ENERGY/ACQUISITION & ASSI		Owner	Withdrawn	Copy	
07/10/1997	98-0003	EFFECTS OF ELECTRONIC ORBITAL ALIGNMENT IN LASER INDUCED METAL-H2 AND METAL-CH4 REACTIONS	NATIONAL SCIENCE FOUNDATION	07/22/1997	Owner	Funded	Copy	
04/11/1997	97-0262	STUDY OF THE PHOTOCHEMISTRY OF METAL CVD (PHOTOCHEMICAL LASER DEPOSITION) PRECURSORS IN CLUSTER ENVIRONMENT	RESEARCH CORPORATION	04/15/1997	Owner	Not Funded	Copy	
11/14/1996	97-0112	STUDY OF THE PHOTOCHEMISTRY OF METAL CVD (PHOTOCHEMICAL LASER DEOSITION) PRECURSORS IN CLUSTER ENVIRONMENT	RESEARCH CORPORATION	11/15/1996	Owner	Not Funded	Copy	
10/11/1996	97-0066	STUDIES OF ALIGNMENT EFFECTS IN LASER INDUCED REACTIVE COLLISIONS	NATIONAL SCIENCE FOUNDATION	10/17/1996	Owner	Not Funded	Copy	
12/11/1995	96-0126	THEORETICAL STUDIES OF METAL-RARE-GAS AND METAL-2 POTENTIALS	PETROLEUM RESEARCH FUND		Owner	Not Funded	Copy	
10/23/1995	96-0084	TRANSITION STATE SPECTROSCOPY AND DYNAMICS OF LASER INDUCED REACTIVE COLLISIONS	DOD-ARMY/ARO		Owner	Not Funded	Copy	

10/04/1995	96-0054	LASER SPECTROSCOPY, ENERGY TRANSFER AND DYNAMICS OF LASER INDUCED REACTIONS	US DEPT OF ENERGY		Owner	Not Funded	Copy	
10/02/1995	96-0053	STUDIES OF LASER INDUCED REACTIVE COLLISIONS	NATIONAL SCIENCE FOUNDATION	10/17/1995	Owner	Not Funded	Copy	
06/19/1995	95-0298	INTER-ATOMIC POTENTIAL: AN ABINITIO STUDY	PETROLEUM RESEARCH FUND		Owner	Withdrawn	Copy	
05/16/1995	95-0278	AB INITIO STUDIES OF METAL-RARE-GAS AND METAL-HYDROGEN INTERACTION POTENTIALS	NATIONAL SCIENCE FOUNDATION		Owner	Funded	Copy	
10/03/1994	95-0069	THEORETICAL INVESTIGATION OF THE INTERAC	NATIONAL SCIENCE FOUNDATION		Owner	Not Funded	Copy	
	08-0346	Lin NASA Proposal for Sol 08-URC-0015	NASA-NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	06/30/2008	Investigator	Proposal Approved	Copy	