
Curriculum Vitae of Tonya Coffey

Contact Information

Address: Room 231 CAP Bldg., 525 Rivers St., Physics and Astronomy Dept., Appalachian State University, Boone, NC 28608

Phone: 828-262-2437 (work)

Email: coffeyts@appstate.edu

Research Interests and Expertise

Nanotribology (the study of friction on the nanoscale), Tribology, Ultra High Vacuum Technology, Microscopy (specifically x-ray microscopy, scanning electron microscopy, atomic force microscopy, and scanning tunneling microscopy), and Microanalysis

Education

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| North Carolina State University | 1996 | B.S. Physics (minors in Mathematics and Spanish) |
| North Carolina State University | 1999 | M.S. Physics |
| Study Abroad; Madrid; ASU | 6/93—8/93 | Art/Spanish |
| Study Abroad; London; NCSU | 6/95—8/95 | Art/Culture |
| North Carolina State University | 8/04 | Ph.D., physics |

Academic and Related Professional Experience

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| 6/94—8/94 | Research Experience for Undergraduates; NCSU Astrophysics; Dr. S. Reynolds |
| 1994-1996 | Teaching Assistant to University Scholars Program at N.C. State |
| 1996-1997 | Teaching Assistant in Physics Department, N.C. State |
| 1996-6/2004 | Research Assistant, N.C. State Physics Department |
| 8/99—5/00 | Preparing the Professoriate Program, N.C. State |
| Present | Assistant Professor, Physics Dept., Appalachian State University |

Honors and Awards

Petroleum Research Fund Type G Grant, 2006-2008; NC Space Grant New Investigations Award, 2006-2008; University Research Council Mini-Grant, 2005; U.S. Department of Education Graduate Assistance in Areas of National Need Fellowship, Fall 1997-Spring 2000; Leadership Award for a Graduating Senior in the College of Physical and Mathematical Sciences, 1996; Graduated Summa Cum Laude, 1996; Phi Beta Kappa, 1995; Phi Kappa Phi, 1995; Order of Thirty and Three (an organization for outstanding rising juniors at N.C. State), 1994; Sigma Pi Sigma, 1995; Pi Mu Epsilon, 1995; Golden Key National Honor Society, 1995; MENSA, 1991-Present; University Scholars Program, 1992-1996; Caldwell Scholarship, 1992-1996; National Merit Scholarship Finalist, 1992; J. Motley Morehead Scholarship Finalist, 1992

Professional Activities

American Physical Society, 1998-Present; American Vacuum Society, 2002-present; Microscopy Society of America, 1997-Present; Sigma Xi, (2006-Present); Society of Physics Students, 1993-2004 (President, NCSU Chapter, 1995-1996); Graduate Physics Student Association, 1997-2004

Publications

1. "Impact of Atomic Corrugation on Atomic Friction as Probed by QCM," T. Coffey and J. Krim, *Physical Review Letters*, **95**, 076101 (2005).

2. "QCM Studies of the Slippage of Solid and Liquid Krypton Monolayers on Metal(111) and C₆₀ Surfaces," T. Coffey and J. Krim, *Physical Review B*, **72**, 235414 (2005).
3. "C₆₀ Molecular Bearings and the Phenomenon of Nanomapping" T. Coffey and J. Krim, *Physical Review Letters*, **96**, 186104 (2006).
4. "Gas Adsorption on a C₆₀ Monolayer," R.A. Trasca, T. Coffey, J. Krim and M.W. Cole, in progress.
5. "Nanotribology." T. Coffey and J. Krim, in: *The Encyclopedia of Nanoscience and Nanotechnology*, American Scientific Publishers, Stevenson Ranch, California, 2004.
6. "A scanning probe and quartz crystal microbalance study of the impact of C₆₀ on friction at solid-liquid interfaces." T. Coffey, M. Abdelmaksoud, and J. Krim. *Journal of Physics: Condensed Matter* **13** (2001) 4991-4999.
7. "A scanning probe and quartz crystal microbalance study of C₆₀ on mica and Ag(111) surfaces." T. Coffey, M. Abdelmaksoud, and J. Krim, in: B. Bhushan (Ed.), *Proceedings of the NATO Advanced Study Institute on Fundamentals of Tribology and Bridging the Gap Between Macro-, Micro/Nanoscales*, Kluwer Academic Publishers, The Netherlands, 2001.
8. "Characterization of the effects of soft x-ray irradiation on polymers." T. Coffey, S. Urquhart, H. Ade. *Journal of Electron Spectroscopy and Related Phenomena* **122** (2002) 65-78.
9. "Characterization of the X1-STXM spectroscopy acquisition mode utilizing carbon dioxide." in *X-ray Microscopy and Spectromicroscopy*. A.P. Smith, T. Coffey, and H. Ade. 1996, Wurzburg, Germany: Springer-Verlag.

Selected Presentations

1. "X-ray radiation damage of polymers in a scanning transmission x-ray microscope." In *EXPO: Microscopy and Microanalysis '98*. T. Coffey *et al.* 1998. Atlanta, Georgia. Springer-Verlag. (Conference Proceedings)
2. "GUF: Grand Unified Friction?" In 2000 NATO ASI on Fundamentals of Tribology and Bridging the Gap Between Macro-, Micro-, and Nanoscales. T. Coffey, M. Abdelmaksoud, and J. Krim. August 13-25, 2000, Keszthely, Hungary.
3. "The effect of C₆₀ on interfacial friction and wetting of toluene." In AVS 47th International Symposium. T. Coffey, M. Abdelmaksoud, and J. Krim. October 2-6, 2000, Boston, MA.
4. "The effect of C₆₀ on interfacial friction and wetting of toluene." In American Physical Society March Meeting 2000. T. Coffey, M. Abdelmaksoud, and J. Krim. March, 2000, Minneapolis, MN.
5. "Interfacial friction of methanol sliding on rigid vs. rotating fullerenes." In AVS 48th International Symposium. T. Coffey, M. Abdelmaksoud, and J. Krim. October 28-November 2, 2001, San Francisco, CA.
6. "Nanomorphism of C₆₀ and Hydrocarbons on Metal Surfaces." In Physical Electronics Conference. T. Coffey and J. Krim, June, 2002, Atlanta, GA.
7. "Nanomorphism of C₆₀ on Metal Surfaces," In AVS 49th International Symposium. T. Coffey, M. Abdelmaksoud, and J. Krim, November 3-8, 2002, Denver, CO.
8. "QCM Studies of Phonon and Electron Scattering Effects for Monolayer Octane/Cu(111) and Octane/Pb(111) Interfaces," In AVS 50th International Symposium. T. Coffey and J. Krim, November, 2003, Baltimore, MD.
9. "Impact of Atomic Corrugation on Sliding Friction as Probed by QCM," In AVS 50th International Symposium. T. Coffey, S. Winder, and J. Krim, November, 2003, Baltimore, MD.
10. "Nanotribology: Friction at the Nanometer Scale," In AReMS Fall Meeting, T. Coffey, October 15, 2004, Boone, NC.

11. "QCM Studies of the Slippage of Solid and Liquid Krypton Monolayers on Metal(111) and C₆₀ Surfaces," presented in a poster session on November 1, 2005 at the AVS 52nd International Symposium, T. Coffey and J. Krim, Boston, MA.

M.S. Thesis Advisor: H. Ade. *Radiation Damage to Polymers with Soft X-rays*. 1999.

Ph.D. Thesis Advisor: J. Krim, *Nanomorphism*, 2004.