

Kevin R. Coffey, Ph. D., Professor

CONTACT: Department of Materials Science and Engineering and
Advanced Materials Processing and Analysis Center
University of Central Florida
P.O. Box 162455, 4000 Central Florida Boulevard
Orlando, FL 32816-2455

Voice: (407) 823-2175
Mobile: (407) 923-2224
Fax: (407) 882-1462

Office: Room 381D, Engineering I
Laboratory: Suite 308, Orlando Technical Center
and Room 124, Engineering I

Email: krcoffey@ucf.edu
Webpage: <http://pegasus.cc.ucf.edu/%7Eampac/coffey.html>

RESEARCH and TEACHING INTERESTS

- Materials Science of Thin Films, Materials Kinetics
- Electronic Materials, Magnetic Materials and Semiconductors
- Resistive Scattering of Electrons from Surfaces and Interfaces in Metals
- Thin Film Reactions and the Formation of Intermetallic Phases
- Giant Magnetoresistance in Nanostructured Devices
- Grain Boundary Diffusion and Thermal Stability of Thin Films
- Magnetic Recording Media Materials and Processing
- Transmission Electron Microscopy for Materials Characterization
- Chemical Ordering in Bulk and Nanoparticle Intermetallic Systems
- X-ray Diffraction for Characterization of Thin Film Materials
- Processing of Thin Films Materials, Thin Film Deposition Techniques
- Amorphous Magnetic Alloys

SYNOPSIS OF PROFESSIONAL, SCHOLARLY, AND SERVICE ACHIEVEMENTS

- Secured \$2.8 M in Research Contracts and Grants as a PI, over \$4.3 M including activity as co-PI. Funding sources include:
 - ✓ National Science Foundation
 - ✓ Semiconductor Research Corporation
 - ✓ Department of Defense, Department of Energy
 - ✓ Industry: Intel, Tyco, Lockheed Martin, Planar, Mainstream, Spectre, Plasmonics
 - ✓ Competitive matching grants from Florida High Tech Corridor and University of Central Florida
- Over 75 referred articles published in journals having a cumulative total of more than 1,800 citations, averaging more than 22 citations per article published (data from Web of Science). Impact evidenced by an h-index of 21. Additional published works include:
 - ✓ 24 Issued U.S. Patents, several additional U.S. Patent applications in progress
 - ✓ 21 refereed articles published in conference proceedings
 - ✓ Numerous non-referred conference proceeding publications
 - ✓ Numerous contributed and invited presentations, at conferences, seminars, and symposia
- Exemplary contributions to the undergraduate and graduate academic programs at the University of Central Florida; in electronic materials, materials kinetics, and interdisciplinary research and education:
 - ✓ New undergraduate core (materials thermodynamics and kinetics) and elective (electronic materials) courses
 - ✓ New graduate core (materials kinetics) and elective (materials science of thin films, electronic principles of materials properties) courses
 - ✓ Tenured in the Department of Mechanical, Materials, and Aerospace Engineering
 - ✓ Secondary appointments in the Department of Physics and in the School of Electrical Engineering and Computer Science
 - ✓ Graduate Program Coordinator for the Materials Science and Engineering M.S. and Ph. D. degree programs (~50 PhD students and ~20 MS students in program).
 - ✓ Currently supervising three Materials Ph.D. students
 - ✓ Have supervised and graduated four Materials Science Ph.D., one Physics Ph.D., two Electrical Engineering Ph.D., three Electrical Engineering M.S., and one Materials and one Mechanical Engineering M.S. students
- Service contributions include international, local, and university activities:
 - ✓ Interim Chair of the newly formed Department of Materials Science and Engineering at UCF.
 - ✓ International conferences; program co-chair, committee and session chairs
 - ✓ Local conferences; Treasurer of FI chapter of AVS (www.flavs.org)
 - ✓ Member of the Faculty Senate of the University of Central Florida, Member and Chair of the UCF Research Council, Member of the UCF Graduate Policy and Appeals Committees and Chair of the UCF Graduate Appeals Committee.

PROFESSIONAL EMPLOYMENT HISTORY

Aug. 02 – Present	Interim Chair (since Sept. 2012), Professor (since Aug. 2010), and Associate Professor. Department of Materials Science and Engineering Advanced Materials Processing and Analysis Center University of Central Florida, Orlando, Florida. Active research programs in intermetallic nanoparticles, semiconductor interconnect metallurgy, thin film reactions, and bolometer materials Active teaching program in electronic materials, and materials kinetics and graduate and undergraduate levels with new course developments and maintenance.
Mar. 98 – Jan. 02	Senior Technical Staff Member IBM, Storage Technology Division, San Jose, California 1998-2001: Managed group of scientists/engineers developing new magnetic recording media process technology, corrosion resistance, and nano-scale tribology, i.e., 5 nm amorphous carbon films and monolayer lubricants. 2001-2002: Developed new concepts in thermally assisted magnetic recording at IBM's Almaden Research Center.
July 97 – Mar. 98	Senior Director, Magneto-Optic Recording Media Seagate Technology, Recording Media Group, Fremont, California Developed novel first surface flyable magneto-optic recording media for optical Winchester applications.
Oct. 95 – July 97	Manager, Magnetic Materials Research and Development Sensormatic Electronics Corporation, Boca Raton, Florida Developed semi-hard and soft magnetic materials and processes for electronic article surveillance applications.
Oct. 89 – Sept. 95	Advisory Scientist/Engineer IBM, Storage Technology Division, San Jose, California Basic research on thin film materials and processing directed towards magnetic recording applications
Feb. 86 – July 89	Research Assistant and Graduate Fellow Massachusetts Institute of Technology, Cambridge, Massachusetts Investigated Nb-Al reactions for superconducting wire applications.
Sept. 81 – July 85	Physicist Nashua Corporation, Nashua, New Hampshire Developed sputtered and plated thin film magnetic recording media.
July 79 – Sept. 81	Physicist Saxon Copystatics, Miami, Florida, Developed CdS photoreceptors for electro-photographic copiers.
July 76 – July 79	Auto Mechanic/Shop Foreman Autorama, Miami, Florida, Mechanic at Mazda and British Leyland dealership, part-time sport car racer

EDUCATIONAL BACKGROUND

- Jan. 86 – Sept. 89 Doctor of Philosophy in Materials Science and Engineering
- Massachusetts Institute of Technology
Cambridge, Massachusetts
Dissertation title: "Thin Film Reaction Kinetics in Multilayers of Niobium/Aluminum."
Advisors: David A. Rudman and Simon Foner
Major: Electronic Materials
Minor: Management of Technology
GPA: 5.0/5.0
- Sept. 83 – Sept. 85 Master of Science in Physics
- Northeastern University
Boston, Massachusetts
Non-thesis option, part-time student
- Sept. 77 – June 79 Bachelor of Science in Mechanical Engineering Technology
- Florida International University
Miami, Florida
Part-time student
- Jan. 73 - July 75 Bachelor of Arts in Physics
- New College
Sarasota, Florida

RESEARCH GRANTS and AWARDS

External, as Principal Investigator

1. K. R. Coffey, "Thermochromic Polycrystalline VO₂ Thin Film Deposition and Processing," Plasmonics and the Florida High Tech Corridor, 2013, \$53,333.
2. K. R. Coffey, "Co, Ni, Ru, and W as Alternate Interconnects for sub-30nm Linewidths, Semiconductor Research Corporation, 2012-2014, \$270,000.
3. K. R. Coffey, "Vanadium Dioxide (VO₂) electro-optic shutters for fast, non-mechanical, amplitude modulation," Plasmonics Inc. and Florida High Tech Corridor, 2011-2012, \$52,000.
4. K. R. Coffey, "VO_x Bolometer Development," Plasmonics, Inc. 2011-2012, \$18,000.
5. K. R. Coffey, "Hydrogen Permeation Membrane," Mainstream Engineering and Florida High Tech Corridor, 2010-2011, \$40,000.
6. K. R. Coffey, "Solid-State All Inorganic Rechargeable Lithium Batteries," Planar Energy Devices, DOE ARPA-E Program, and the Florida High Tech Corridor, 2010-2012, \$150,000.
7. K. R. Coffey, "Demonstration of Metal-Metal Oxide Thin Film Reactions," Spectre Enterprises Inc. and the Florida High Tech Corridor, 2009, \$280,000.
8. K. R. Coffey, "Nano-Structured Enhanced Microfluidics Device for Spot Cooling Phase II," Mainstream Engineering and the Florida High Tech Corridor, 2009-2011, \$235,000.
9. K. R. Coffey, "Reaction Velocity of Dense, Layered, Nanoscale Energetic Materials," Air Force Research Laboratory, 2009-2011, \$100,000.
10. K. R. Coffey, "Nano-Structured Enhanced Microfluidics Device for Spot Cooling Phase I Option," Mainstream Engineering, 2008-2009, \$13,630.
11. K. R. Coffey, "Amorphous Magnetic Alloys," Tyco Industries, 2008-2009, \$28,000.
12. K. R. Coffey and K. B. Sundaram, "Inverted Structure Thin Film Li Batteries," Planar Energy Devices and the Florida High Tech Corridor, 2008-2009, \$66,667.
13. K. R. Coffey, "Thin Film Magnetics Development" Intel Corporation, 2007-2008, \$5,000.

14. K. R. Coffey, "Nanolayered Energetic Materials," Air Force Office of Scientific Research, 2007-2008, \$49,320.
15. K. R. Coffey and K. B. Sundaram, "Amorphous Magnetic Alloys," Tyco Industries and the Florida High Tech Corridor, 2007-2008, \$59,861.
16. K. R. Coffey, "Inverted Structure Thin Film Li Batteries," Planar Energy Devices and the Florida High Tech Corridor, 2007-2008, \$150,000.
17. K. R. Coffey and K. B. Sundaram, "Amorphous Magnetic Alloys," Tyco Industries and the Florida High Tech Corridor, 2006-2007, \$66,667.
18. K. R. Coffey and R. Kumar, "Thin Film Energetic Materials," Lockheed Martin and the Florida High Tech Corridor, 2006-2007, \$75,000.
19. K. R. Coffey and K. Barmak, "Electrical Resistivity of Sub-45nm Interconnects: The Classical Size Effect." Semiconductor Research Corporation, 2005-2008, \$330,000.
20. K. R. Coffey, "Multilayer Thin Films for Energy Storage," Lockheed Martin, 2005-2006, \$16,000.
21. K. R. Coffey and K. B. Sundaram, "Giant Magneto-Impedance Devices," Tyco Industries and the Florida High Tech Corridor, 2005-2006, \$66,667.
22. K. R. Coffey, "Electronics Devices Materials Characterization and Failure Analysis Training," Chip Supply Corporation and the Florida High Tech Corridor, 2004-2005, \$3,750.
23. K. R. Coffey, "Thin Film Magnetics Development," Intel Corporation, 2004-2005, \$2,500.
24. K. R. Coffey and K. B. Sundaram, "Semiconductor Devices for Electronic Article Surveillance Application," Tyco Industries and the Florida High Tech Corridor, 2004-2005, \$58,333.
25. K. R. Coffey and R. R. Vanfleet, "NER: Small Well-Ordered Intermetallic Magnetic Nanoparticles," National Science Foundation, 2004-2005, \$161,261.
26. K. R. Coffey and K. B. Sundaram, "Security Technology for Electronic Article Surveillance Application," Tyco Industries and the Florida High Tech Corridor, 2003-2004, \$50,000.

External, as Co-Principal Investigator

1. P. Schelling and K. R. Coffey, "Oriented single-crystal nanowires for mitigation of the classical resistivity size effect: A theoretical study," Semiconductor Research Corporation, 2012-2013, \$40,000.
2. K. Barmak and K. R. Coffey, "High Throughput Electron and X-ray Diffraction Based Metrology of Nanoscale Materials," Semiconductor Research Corporation, 2011-2013, \$300,000.
3. Y.-H. Sohn and K.R. Coffey, "Tracer, Intrinsic and Interdiffusion Study in Mg-Alloys," Oak Ridge National Laboratory, 2011-2012, \$33,688,
4. Y.-H. Sohn and K.R. Coffey, "Diffusion and Microstructural Evolution of The Fuel-Cladding Interaction," Batelle Energy Alliance, 2010-2012, \$140,000.
5. R. R. Vanfleet, K. R. Coffey, "Chemical Ordering Phase Transitions in Intermetallic Nanoparticles," National Science Foundation, 2009-2012, \$310,803.
6. Y.-H. Sohn and K.R. Coffey, "Measurement of Isotopic Tracer Diffusion Coefficients in Mg-alloys for Integrated Computational Materials Engineering," UT-Batelle, LLC., 2008-2011, \$140,000.
7. G. D. Boreman and K. R. Coffey, "UHV Evaporator for IR Antenna Fabrication" Office of Naval Research, Defense University Research Instrumentation Program, 2006-2007, \$309,600.
8. R. Kumar and K. R. Coffey, "Thin Film Energetic Materials," Lockheed Martin and the Florida High Tech Corridor, 2005-2006, \$66,667.
9. K. B. Sundaram and K. R. Coffey, "Development of Thin Film High Temperature Sensors," Florida High Tech Corridor, 2005-2006, \$33,254.

Internal, as Principal Investigator

1. K. R. Coffey, "Undergraduate Research Initiative," University of Central Florida, 2005-2006, \$3,584.

2. K. R. Coffey and L. A. Gianuzzi, "Novel Structure for Grain Boundary Research," In-House Research Grant, University of Central Florida, 2003-2004, \$7,500.
3. K. R. Coffey and D. C. Malocha, "Advanced Six-Source Sputter Deposition System," Presidential Initiative to Fund Major Research Equipment, University of Central Florida, 2003-2004, \$386,000.

Internal, as Co-Principal Investigator

1. G. Boreman and K. R. Coffey, "UHV Evaporator w/ In-Situ Spectroscopic Ellipsometry," Presidential Initiative to Fund Major Research Equipment, University of Central Florida, 2006-2007, \$153,950.

PUBLICATIONS: REFERRED JOURNALS/PERIODICALS

- 1) "Grain Boundary Character Distribution of Nanocrystalline Cu Thin Films Using Stereological Analysis of Transmission Electron Microscope Orientation Maps," A. D. Barbal, K. J. Ganesh, X. Liu, S. B. Lee, J. Ledonne, T. Sun, B. Yao, A. P. Warren, G. S. Rohrer, A. D. Rollet, P. J. Ferreira, **K. R. Coffey**, and K. Barmak, *Microscopy and Microanalysis*, vol. 19, pages 111-119, Feb. 2013.
- 2) "Electron mean free path of tungsten and the electrical resistivity of epitaxial (110) tungsten films," D. Choi, C. S. Kim, D. Baveh, S. Chung, A. P. Warren, N. T. Nuhfer, M. F. Toney, **K. R. Coffey**, K. Barmak, *Physical Review B*, vol. 86, Article 046432, July 2012.
- 3) "Interdiffusion and reaction between uranium and iron," K. Huang, Y. Park, A. Ewh, B. H. Sencer, J. R. Kennedy, **K. R. Coffey**, and Y.-H. Sohn, *Journal of Nuclear Materials*, vol. 424, pages 82-88, May, 2012. Times Cited: 1
- 4) "Aluminum Impurity Diffusion in Magnesium," S. Brennan, A. P. Warren, **K. R. Coffey**, N. Kulkarni, P. Todd, M. Klimov, and Y.-H. Sohn, *Journal of Phase Equilibria and Diffusion*, vol. 33, pages 121-125, April 2012.
- 5) "Grain growth and the puzzle of its stagnation in thin Films: A detailed comparison of experiments and simulations", K. Barmak, E. Eggeling, R. Sharp, S. Roberts, T. Shyu, T. Sun, B. Yao, S. Ta'san, D. Kinderlehrer, A. Rollett, **K. Coffey**, *Materials Science Forum, Trans. Tech.* vol. 715-716, pages 473-479 (2012).
- 6) "Evolution of nanoscale roughness in Cu/SiO₂ and Cu/Ta interfaces," A.P. Warren, T. Sun, B. Yao, K. Barmak, M. F. Toney, **K. R. Coffey**, *Applied Physics Letters*, vol. 100, Article 024106, January 2012. Times Cited: 2
- 7) "Phase, grain structure, and resistivity of sputter-deposited tungsten films," D. Choi, B.C. Wang, S. Chung, X. Liu, A. Darbal, A. Wise, N.T. Nuhfer, K. Barmak, A. P. Warren, **K. R. Coffey**, and M. F. Toney, *Journal of Vacuum Science and Technology A*, vol. 29 Article 051512, 2011. Times Cited: 2
- 8) "Optical characterization of BCN films deposited at various N₂/Ar gas flow ratios by RF magnetron sputtering," V. O. Todi, B. P. Shantheyanda, R. M. Todi, K. B. Sundaram, **K. Coffey**, *Materials Science and Engineering B – Advanced Functional Solid State Materials*, vol.176, pages 878-882, 2011.
- 9) "Strong Coupling between Nanoscale Metamaterials and Phonons," D/ J/ Shelton, I. Brener, J. C. Ginn, M. B. Sinclair, D. W. Peters, **K. R. Coffey**, and G. D. Boreman, *Nanoletters*, vol. 11, pages 2104-2108, 2011. Times Cited: 8
- 10) "Determination of optimum Si excess concentration in Er-doped Si-rich SiO₂ for optical amplification at 1.54 μ m," O. Savchyn, **K. R. Coffey**, P. G. Kik, *Applied Physics Letters*, vol. 97, Article 201107, 2010. Times Cited: 1

- 11) "High-temperature optical properties of sensitized Er³⁺ in Si-rich SiO₂ - implications for gain performance," O. Savchyn, R. M. Todi, **K. R. Coffey**, P. G. Kik, *Optical Materials*, vol. 32, Pages 1274-1278, 2010. Times Cited: 1
- 12) "Surface and grain boundary scattering in nanometric Cu films," T. Sun, B. Yao, A.P. Warren, K. Barmak, M.F. Toney, R.E. Peale, and **K. R. Coffey**, *Physical Review B*, Vol. 81, Article 155454, 2010. Times Cited: 24
- 13) "High contrast hollow-cone dark field transmission electron microscopy for nanocrystalline grain size quantification," B. Yao, T. Sun, A. Warren, H. Heinrich, K. Barmak, and **K. R. Coffey**, *Micron*, Volume 41, Pages 177-182, 2010. Times Cited: 8
- 14) "Effect of thin silicon dioxide layers on resonant frequency and amplitude in infrared metamaterials," D.J. Shelton, D.W. Peters, M.B. Sinclair, I. Brener, L.K. Warne, L.I. Basilio, **K.R. Coffey**, G. D. Boreman, *Optics Express*, Col. 18, Pages 1085-1090, 2010. Times Cited: 10.
- 15) "Experimental demonstration of tunable phase in a thermochromic infrared-reflectarray metamaterial," D.J. Shelton, **K.R. Coffey**, G. D. Boreman, *Optics Express*, Vol. 18, Pages 1330-1335, 2010. Times Cited: 5.
- 16) "Excitation wavelength independent sensitized Er³⁺ concentration in as-deposited and low temperature annealed Si-rich SiO₂ films," O. Savchyn, R. M. Todi, **K. R. Coffey**, L. K. Ono, B. R. Cuenya, P. G. Kik, *Applied Physics Letters*, vol. 95, Article 231109, 2009. Times Cited: 9.
- 17) "Orientation Imaging of Nanocrystalline Platinum Films in the TEM," A. Darbal, K. Barmak, T. Nuhfer, D. J. Dingley, G. Meaden, J. Michael, T. Sun, B. Yao, and **K. R. Coffey**, *Microscopy and Microanalysis*, vol. 15, pages 1232-1233, 2009. Cited: 2
- 18) "Observation of temperature-independent internal Er³⁺ relaxation efficiency in Si-rich SiO₂ films," O. Savchyn, R. M. Todi, **K. R. Coffey**, and P. G. Kik, *Applied Physics Letters*, vol. 94, Article 241115, 2009. Times Cited: 7.
- 19) "Thickness dependence of structure and magnetic properties of annealed [Fe/Pt]_n multilayer films," B. Yao and **K.R. Coffey**, *Journal of Applied Physics*, vol. 105, Article 07A726, 2009. Cited: 2
- 20) "Quantification of L10 phase volume fraction in annealed [Fe/Pt]_n multilayer films," B. Yao and **K.R. Coffey**, *Journal of Applied Physics*, vol. 105, Article 033901, 2009. Times Cited: 8.
- 21) "Dominant role of grain boundary scattering in the resistivity of nanometric Cu films" T. Sun, B. Yao, A.P. Warren, K. Barmak, M.F. Toney, R.E. Peale, and **K. R. Coffey**, *Physical Review B*, vol. 79, Article 041402, 2009. Times Cited: 30.

- 22) "Multilevel sensitization of Er³⁺ in low-temperature-annealed silicon-rich SiO₂," O. Savchyn, R. M. Todi, **K. R. Coffey**, and P. G. Kik. *Applied Physics Letters*, vol. 93, Article 233120, 2008. Times Cited: 12.
- 23) "A high-throughput approach for cross-sectional transmission electron microscopy sample preparation of thin films," B. Yao and **K. R. Coffey**, *Journal of Electron Microscopy*, Vol. 57, no., 6, p. 189-194, 2008. Times Cited: 2.
- 24) "Relaxation time effects on dynamic conductivity of alloyed metallic thin films in the infrared band," D. Shelton, T. Sun, J. Ginn, **K. Coffey**, and G. Boreman, *Journal of Applied Physics*, vol. 104, Article. 103514, 2008. Times Cited: 4.
- 25) "On the phase identification of dc magnetron sputtered Pt-Ru alloy thin films," A.P. Warren, R. M. Todi, K. Barmak, K.B. Sundaram, and **K. R. Coffey**, *Journal of Vacuum Science and Technology, A*, vol. 26, no. 26, p. 1208-1212, 2008. Times Cited: 1
- 26) "Grain growth and void formation in dielectric-encapsulated Cu thin films," B. Yao, T. Sun, V. Kumar, K. Barmak, **K. R. Coffey**, *Journal of Materials Research*, vol. 23, no. 7, p. 2033-2039, 2008. Times Cited: 1.
- 27) "Classical size effect in oxide-encapsulated Cu thin films: impact of grain boundaries versus surfaces on resistivity," T. Sun, B. Yao, A. P. Warren, S. Roberts, V. Kumar, K. Barmak, **K. R. Coffey**, *Journal of Vacuum Science and Technology, A*, vol. 26, no. 4, p. 605-609, 2008. Times Cited: 13.
- 28) "Effect of hydrogen passivation on luminescence-center-mediated Er excitation in Si rich SiO₂ with and without Si nanocrystals," O. Savchyn, P. G. Kik, R. M. Todi, **K. R. Coffey**, H. Nukala, and H. Heinrich, *Physical Review B*, vol. 77, no. 20, Article 205438, 2008. Times Cited: 15.
- 29) "The effective interdiffusivity, structure, and magnetic properties of [Fe/Pt]_n multilayer films", B. Yao, and **K.R. Coffey**, *Journal of Applied Physics*, Vol. 103, no. 7, Article 07E107, 2008. Times Cited: 8.
- 30) "Back-etch method for plan view transmission electron microscopy sample preparation of optically opaque films," B. Yao and **K. R. Coffey**, *Journal of Electron Microscopy*, Vol. 57, no., 2, p. 47-52, 2008. Times Cited: 4
- 31) "The influence of periodicity on the structure and properties of annealed [Fe/Pt]_n multilayer films," B. Yao and **K. R. Coffey**, *Journal of Magnetism and Magnetic Materials*, vol. 320, no. 3-4, p. 559-564, 2008. Times Cited: 6
- 32) "Luminescence-center-mediated excitation as the dominant Er sensitization mechanism in Er-doped silicon-rich SiO₂ films," O. Savchyn, F. R. Ruhge, P. G. Kik, R. M. Todi, **K. R. Coffey**, H. Nukala, and H. Heinrich. *Physical Review B*, vol. 76, article 195419. 2007. Times Cited: 46

- 33) "Comparison of the Work Function of Pt-Ru Binary Metal Alloys Extracted from MOS Capacitor and Schottky Barrier Diode", R. M. Todi, M. S. Erickson, K. B. Sundaram, K. Barmak, **K. R. Coffey**, *IEEE Transactions on Electron Devices*, vol. 54, no. 4, p. 807-813, 2007. Times Cited: 5
- 34) "A modified back-etch method for preparation of plan-view high-resolution transmission electron microscopy samples," B. Yao, R.V. Petrova, R.R. Vanfleet, **K.R. Coffey**, *Journal of Electron Microscopy*, Vol. 55, Issue 4, pages 209-214, 2006. Times Cited: 5
- 35) "Characterization of Pt-Ru Binary Alloy Thin Films for Work Function Tuning," R. M. Todi, K. B. Sundaram, **K. R. Coffey**, *IEEE Electron Device Letters*, Vol. 27, Issue 7, pages 542-545, 2006. Times Cited: 9
- 36) "Compositional stability of FePt nanoparticles on SiO₂/Si during annealing", B. Yao, R. V. Petrova, R. R. Vanfleet, V. Lam, and **K.R. Coffey**, *Journal of Applied Physics*, Vol. 99, Issue 8, Article No. 08E913, 2006. Times Cited: 8
- 37) "Experimental study of the interaction of laser radiation with silver nanoparticles in SiO₂ matrix," M. Sendova, M. Sendova-Vassileva, J. C. Pivin, H. Hofmeister, **K. Coffey**, A. Warren, *Journal of Nanoscience and Nanotechnology*, Vol. 6, Issue 3, pages 748-755, 2006. Times Cited: 17
- 38) "X-ray photoelectron spectroscopy analysis of oxygen annealed radio frequency sputter deposited SiCN thin films," R. M. Todi, K. B. Sundaram, **K. R. Coffey**, *Journal of the Electrochemical Society*, Vol. 153, issue 7, pages G640-G643, 2006. Times Cited: 11
- 39) "Characterization of Individual L10 FePt Nanoparticles," R. V. Petrova, R. R. Vanfleet, D. Richardson, B. Yao, and **K. R. Coffey**, *IEEE Transactions on Magnetics*, vol. 41, Issue 10, pages 3202-3204, 2005. Times Cited: 7.
- 40) "On the relationship of magnetocrystalline anisotropy and stoichiometry in epitaxial L1(0) CoPt (001) and FePt (001) thin films," K. Barmak, J. Kim, **K. R. Coffey**, M. F. Toney, A. J. Kellock, J.-U. Thiele, *Journal of Applied Physics*, Vol. 98, Issue 3, Article 033904, Aug. 2005. Times Cited: 67
- 41) "Comparison of the agglomeration behavior of thin metallic films on SiO₂," P. R. Gadkari, A. P. Warren, R. M. Todi, R. V. Petrova, and **K. R. Coffey**, *Journal of Vacuum Science and Technology A*, Vol. 23, Issue 4, pp. 1152-1161, Jul.-Aug. 2005. Times Cited: 25
- 42) "Growth and characterization of sputtered BSTO/BaM multilayers," S. Srinath, N. A. Frey, R. Heindl, H. Srikanth, **K. R. Coffey**, and N. J. Dudney, *Journal of Applied Physics*, Vol. 97, Issue 10, Article 10J115, May 2005. Times Cited: 7
- 43) "Temperature dependence of the magnetization reversal of thin film longitudinal magnetic recording media," **K.R. Coffey**, J.-U. Thiele, and T. Thomson, *IEEE Transactions on Magnetics*, Vol. 40, Issue 4, pp. 2440-2442, July 2004. Times Cited: 3
- 44) "Stoichiometry-anisotropy connections in epitaxial FePt(001) films," K. Barmak, J. Kim, L. H. Lewis, **K. R. Coffey**, M. F. Toney, A. J. Kellock, and J.-U. Thiele, *Journal of Applied Physics*, Vol. 95, Issue 11, part 2, pp. 7501-7503, June 2004. Times Cited: 14

- 45) "Angle-dependent switching of granular and multilayer perpendicular media," T. Thomson, **K. R. Coffey**, and J.-U. Thiele, IEEE Transactions on Magnetics, Vol. 39, Issue 5, pp. 2314-2316, Sept. 2003. Times Cited: 14
- 46) "Angle dependent magnetization reversal of thin film magnetic recording media," **K. R. Coffey**, T. Thomson, and J.-U. Thiele, Journal of Applied Physics, Vol. 93, Issue 10, pp. 8471-8473, May 2003. Times Cited: 17
- 47) "Angular dependence of the switching field of thin film longitudinal and perpendicular magnetic recording media," **K. R. Coffey**, T. Thomson, and J.-U. Thiele, Journal of Applied Physics. Vol. 92, Issue 8, pp. 4553-4559, Oct. 2002 Times Cited: 21
- 48) "Temperature dependent magnetic properties of highly chemically ordered Fe₅₅-xNi_xPt₄₅ L10 films," J.-U. Thiele, **K. R. Coffey**, M.F. Toney, J.A. Hedstrom, and A.J. Kellock, Journal of Applied Physics, Vol. 91, Issue 10, pp. 6595-6600, May 2002. Times Cited: 94
- 49) "Measurement of carbon film thickness by inelastic electron scatter," C. E. Bryson, L. Vasilyev, R. Linder, R. L. White, J.-U. Thiele, **K. R. Coffey**, and J. H. Brannon, Journal of Vacuum Science and Technology A, vol. 19, no. 5, p. 2695-2697, Sept. 2001
- 50) "On the relationship of high coercivity and L1₀ ordered phase in CoPt and FePt thin films," R.A. Ristau, K. Barmak, L.H. Lewis, **K. R. Coffey**, and J. K. Howard, Journal of Applied Physics, vol. 86, no. 8, p. 4527-4533, Oct. 1999. Times Cited: 219
- 51) "Grain growth in ultrathin films of CoPt and FePt," R.A. Ristau, K. Barmak, **K.R. Coffey**, and J.K. Howard, Journal of Materials Research, vol. 14, no. 8, p. 3263-3270, Aug. 1999. Times Cited: 24
- 52) "An EFTEM and conical dark field investigation of co-sputtered CoPt+Yttria stabilized zirconia thin films," R.A. Ristau, F. Hofer, K. Barmak, **K. R. Coffey**, and J.K. Howard, Micron, vol. 29, no. 1, p. 33-41, Feb. 1998. Times Cited: 6
- 53) "Antiferromagnetic interlayer correlations in annealed Ni₈₀Fe₂₀/Ag multilayers," J.A. Borchers, P.M. Gehring, R.W. Erwin, J. F. Ankner, C. F. Majkrzak, T. L. Hylton, **K. R. Coffey**, M.A. Parker, and J. K. Howard, Physical Review B, vol. 54, no. 14, p. 9870-9882, Oct. 1996. Times Cited: 29
- 54) "Nature of the interlayer coupling in annealed Ni₈₀Fe₂₀/Ag multilayers," J.A. Borchers, P.M. Gehring, R.W. Erwin, C. F. Majkrzak, J.F. Ankner, T.L. Hylton, **K.R. Coffey**, M.A. Parker, and J.K. Howard, Journal of Applied Physics, vol. 79, no. 8 part 2A, p. 4762-4764, Apr. 1996. Times Cited: 8
- 55) "Grain growth and ordering kinetics in CoPt thin films," K. Barmak, R.A. Ristau, **K. R. Coffey**, M.A. Parker, and J.K. Howard, Journal of Applied Physics, vol. 79, no. 8 part 2A, p. 5330-5332, Apr. 1996. Times Cited: 47
- 56) "Overview of progress in giant magnetoresistive sensors based on NiFe/Ag multilayers," M.A. Parker, **K. R. Coffey**, J.K. Howard, C.H. Tsang, R.E. Fontana, and T.L. Hylton, IEEE Transactions on Magnetics, vol. 32, no. 1, p. 142-148, Jan. 1996. Times Cited: 20
- 57) "Thin-film structures for low-field granular giant magnetoresistance," **K. R. Coffey**, T.L. Hylton, M.A. Parker, and J.K. Howard, Scripta Metallurgica et Materialia, vol. 33, no. 10-11, p. 1593-1602. Dec. 1995. Times Cited: 7

- 58) "High anisotropy L1(0) thin films for longitudinal recording," **K. R. Coffey**, M.A. Parker, J. K. Howard, IEEE Transactions on Magnetics, vol. 31, no. 6, pt. 1, p. 2737-39, Nov. 1995. Times Cited: 224
- 59) "Microstructural evolution of NiFe/Ag multilayers studied by X-ray diffraction and in-situ high-resolution TEM," E. Snoeck, R. Sinclair, M.A. Parker, T.L. Hylton, **K. R. Coffey**, J.K. Howard, A. Lessmann, and A.I. Bienenstock, Journal of Magnetism and Magnetic Materials, vol. 151, no. 1-2, p. 24-32, Nov. 1995. Times Cited: 20
- 60) "Magnetostatically induced giant magnetoresistance in patterned NiFe/Ag multilayer thin films," T.L. Hylton, M.A. Parker, **K. R. Coffey**, J.K. Howard, R. Fontana, and C. Tsang, Applied Physics Letters, vol. 67, no. 8, p. 1154-1156, Aug. 1995. Times Cited: 25
- 61) "X-ray diffraction and magnetic properties of rapid thermal annealed sendust films," M.I. Ullah, **K. R. Coffey**, M.A. Parker, and J.K. Howard, IEEE Transactions on Magnetics, vol. 30, no. 6, pt. 1, p. 3927-9, Nov. 1994. Times Cited: 10
- 62) Vapor lubrication of thin film disks," **K. R. Coffey**, V. Raman, N. Staud, and D.J. Pocker, IEEE Transactions on Magnetics, vol. 30, no. 6, pt. 1, p. 4146-8, Nov. 1994. Times Cited: 6
- 63) "A new model for grain boundary diffusion and nucleation in thin film reactions," **K. R. Coffey** and K. Barmak, Acta Metallurgica et Materialia, vol. 42, no. 8, p. 2905-2911, Aug. 1994. Times Cited: 10
- 64) "Grain boundary diffusion and its effects on magnetic properties of Co/Cu and Co/Cr thin film bilayers," J.G. Pellerin, S.G.H. Anderson, P.S. Ho, C. Wooten, **K. R. Coffey**, J.K. Howard, and K. Barmak, Journal of Applied Physics, vol. 75, no. 10, pt. 1, p. 5052-60, May 1994. Times Cited: 11
- 65) "Ba-ferrite thin-film media for high density longitudinal recording," T.L. Hylton, M.A. Parker, M. Ullah, **K. R. Coffey**, R. Umphress, and J.K. Howard, Journal of Applied Physics, vol. 75, no. 10, pt. 2A, p. 5960-5, May 1994. Times Cited: 90
- 66) "Microstructural origin of giant magnetoresistance in a new sensor structure based on NiFe/Ag discontinuous multilayer thin films," M.A. Parker, T.L. Hylton, **K. R. Coffey**, and J.K. Howard, Journal of Applied Physics, vol. 75, no. 10, pt. 2B, p. 6382-84, May 1994. Times Cited: 41
- 67) "Low field giant magnetoresistance in discontinuous magnetic multilayers," T.L. Hylton, **K. R. Coffey**, M.A. Parker, and J.K. Howard, Journal of Applied Physics, vol. 75, no. 10, pt. 2B, p. 7058-60, May 1994. Times Cited: 45.
- 68) "Granular giant magnetoresistance at low fields in bilayer thin films," **K. R. Coffey**, T.L. Hylton, M.A. Parker, and J.K. Howard, Applied Physics Letters, vol. 63, no. 11, p. 1579-81, Sept. 1993. Times Cited: 11
- 69) "Giant magnetoresistance at low fields in discontinuous NiFe-Ag multilayer thin films," T.L. Hylton, **K. R. Coffey**, M.A. Parker, and J.K. Howard, Science, vol. 261, no. 5124, p. 1021-4, Aug. 1993. Times Cited: 188
- 70) "Crystallographic structure of CoPtCr/CrV thin films as revealed by cross-section TEM and X-ray pole-figure analysis and its relevance to magnetic properties," M.A. Parker, J.K. Howard, R. Ahlert, and **K. R. Coffey**, Journal of Applied Physics, vol. 73, no. 10, pt. 2A, p. 5560-2, May 1993. Times Cited: 37

- 71) "Properties of epitaxial Ba-hexaferrite thin films on A-, R-, and C-plane oriented sapphire substrates," T.L. Hylton, M.A. Parker, **K. R. Coffey**, and J.K. Howard, Journal of Applied Physics, vol. 73, no. 10, pt. 2B, p. 6257-9, May 1993. Times Cited: 17
- 72) "Differential pumping of Ar/H₂ gas mixtures and carbon film deposition," **K. R. Coffey**, and T.M. Reith, Journal of Vacuum Science and Technology A, vol. 11, no. 1, p. 255-60, Feb. 1993.
- 73) "Thin film reaction kinetics of niobium/aluminum multilayers," **K. R. Coffey**, K. Barmak, D.A. Rudman, and S. Foner, Journal of Applied Physics, vol. 72, no. 4, p. 1341-9, Aug. 1992. Times Cited: 26
- 74) "Stress relaxation and stability of sputtered carbon thin films," V. Raman and **K. R. Coffey**, Applied Physics Letters, vol. 59, no. 25, p. 3244-6, Dec. 1991. Times Cited: 2
- 75) "Phase formation sequence for the reaction of multilayer thin films of Nb/Al," K. Barmak, **K. R. Coffey**, D.A. Rudman, and S. Foner, Journal of Applied Physics, vol. 67, no. 12, p. 7312-22, June 1990. Times Cited: 38
- 76) "The effect of oxygen on phase formation in Nb/Al diffusion couples," K. Barmak, **K. R. Coffey**, D.A. Rudman, and S. Foner, Journal of Applied Physics, vol. 67, no. 8, p. 3780-4, April 1990. Times Cited: 5
- 77) "Experimental evidence for nucleation during thin film reactions," **K. R. Coffey**, L.A. Clevenger, K. Barmak, D.A. Rudman, and C.V. Thompson, Applied Physics Letters, vol. 55, no. 9, p. 852-4, Aug 1989. Times Cited: 76
- 78) "Reaction kinetics of phase formation in Nb-Al powder metallurgy processed wire," **K. R. Coffey**, K. Barmak, D.A. Rudman, C.L.H. Thieme, and S. Foner, IEEE Transactions on Magnetics, vol. 25, no. 2, p. 2093-6, March 1989. Times Cited: 6

PUBLICATIONS: REFERRED CONFERENCE PROCEEDINGS

- 1) "Grain boundary characterization of nanocrystalline Cu from the stereological analysis of transmission electron microscope orientation maps", A. Darbal, K. J. Ganesh, K. Barmak, G. S. Rohrer, P.J. Ferreira, T. Sun, K. R. Coffey, *Microscopy and Microanalysis* 17 (Suppl. 2), 1426-1427, 2011.
- 2) "TEM automated orientation and phase mapping for thin film applications", E. F. Rauch, K. Barmak, J. K. Ganesh, P. Ferreira, A. Darbal, D. Choi, T. Sun, B. Yao, K. R. Coffey, and S. Nicolopoulos, *Proceedings of Microscopy and Microanalysis* 17 (Suppl. 2), 1086-1087, 2011.
- 3) "Impact of surface and grain boundary scattering on the resistivity of nanometric Cu interconnects", K. Barmak, T. Sun, **K. R. Coffey**, AIP Conf. Proc. 1300, Eds. E. Zschech, P. S. Ho, S. Ogawa, Pages 12-22, 2010. (Invited)
- 4) "Grain size determination and grain boundary characterization of nanocrystalline thin films from conical dark field imaging", A. Darbal, K. Barmak, N. T. Nuhfer, T. Sun, **K. R. Coffey**, *Proceedings of Microscopy and Microanalysis* 15, Supplement 2, Pages 1232-1233, 2010.
- 5) "Impurity Diffusion Studies of Aluminum in Magnesium," S. Brennan, A. P. Warren, **K.R. Coffey**, Y.H. Sohn, N. Kulkarni, P. Todd, *Magnesium Technology 2010*, ed. By S.R. Agnew, N.R. Neelameggham, E.A. Nyberg, W.H. Sillekens, TMS, 2010, pp. 537-538
- 6) "Orientation Imaging of Nanocrystalline Platinum Films in the TEM", A. Darbal, K. Barmak, T. Nuhfer, D. J. Dingley, G. Meaden, J. Michael, T. Sun, **K. R. Coffey**, *Proceedings of Microscopy and Microanalysis* 15, Supplement 2, 1232-1233 (2009).
- 7) "Infrared photoconductivity in heavily nitrogen doped a-Si:H," D. Shelton, J. Ginn, **K. Coffey**, and G. Boreman, *Materials Research Society Symposium Proceedings*, vol. 1153, pp. 1153-A02-02, 2009
- 8) "Experimental and Numerical Study of Dense Layered Nano-Energetic Materials, N. Amini, **K. Coffey**, and R. Kumar, *Proceedings of IMECE2007*, 2007.
- 9) "A study on high coercivity and L1₀ ordered phase in CoPt and FePt thin films," R.A. Ristau, K. Barmak, L.H. Lewis, **K. R. Coffey**, and J.K. Howard, p. 347-52 in *Advanced Hard and Soft Magnetic Materials*, Materials Research Society, Warrendale, PA, 1999.
- 10) "L1₀ phase formation in CoPt thin films," R.A. Ristau, K. Barmak, **K. R. Coffey**, and J.K. Howard, p. 119-124 in *Magnetic Ultrathin Films, Multilayers and Surfaces*, Materials Research Society, Warrendale, PA, 1997.
- 11) "Ordering and grain growth kinetics in CoPt thin films," R.A. Ristau, K. Barmak, D.W. Hess, **K. R. Coffey**, M.A. Parker, and J.K. Howard, p. 557-562 in *Thermodynamics and Kinetics of Phase Transformations*, Material Research Society, Pittsburgh, PA, 1996.

- 12) "Magnetic structure determination for annealed Ni₈₀Fe₂₀/Ag multilayers using polarized-neutron reflectivity," J.A. Borchers, P.M. Gehring, C.F. Majkrzak, J.F. Ankner, T.L. Hylton, **K. R. Coffey**, M.A. Parker, and J.K. Howard, p. 577-582 in *Neutron Scattering in Materials Science II*, Materials Research Society, Pittsburgh, PA, 1995.
- 13) "Thermal degradation of tantalum-nickel thin film couples," M.H. Tabacniks, A.J. Kellock, J.E.E. Baglin, **K. R. Coffey**, J.K. Howard, and M.A. Parker, p. 389-394 in *Structure and Properties of Multilayered Thin Films*, Materials Research Society, Pittsburgh, PA, 1995.
- 14) "Unified approach to grain boundary diffusion and nucleation in thin film reactions," **K. R. Coffey** and K. Barmak, p. 193-204 in *Polycrystalline Thin Films: Structure, Texture, Properties and Applications*, Material Research Society, Pittsburgh, PA, 1994.
- 15) "Interface reaction kinetics for permalloy-tantalum thin film couples," A.J. Kellock, J.E.E. Baglin, **K. R. Coffey**, J.K. Howard, M.A. Parker, and D.L. Neiman, p. 211-216 in *Polycrystalline Thin Films: Structure, Texture, Properties and Applications*, Material Research Society, Pittsburgh, PA, 1994.
- 16) "Grain boundary diffusion in NiFe/Ag bilayer thin films," M. Gall, J.G. Pellerin, P.S. Ho, **K. R. Coffey**, and J.K. Howard, p. 217-222 in *Polycrystalline Thin Films: Structure, Texture, Properties and Applications*, Material Research Society, Pittsburgh, PA, 1994.
- 17) "The microstructure and giant magnetoresistance of NiFeAg thin films," M.A. Parker, **K. R. Coffey**, T.L. Hylton, and J.K. Howard, p. 85-90 in *Magnetic Ultrathin Films: Multilayers and Surfaces, Interfaces and Characterization*, eds. B.T. Jonker et al, Material Research Society, Pittsburgh, PA, 1993.
- 18) "Solid phase heteroepitaxy of barium ferrite on sapphire," M.A. Parker, T.L. Hylton, **K. R. Coffey**, and J.K. Howard, p. 625-8 in *Evolution of Surface and Thin Film Microstructure*, eds. H.A. Atwater, E. Chason, M.H. Grabow, and M.G. Lagally, Material Research Society, Pittsburgh, PA, 1993.
- 19) "Grain boundary diffusion in Co/Cu and Co/Cr magnetic thin films," J.G. Holl-Pellerin, S.G.H. Anderson, P.S. Ho, **K. R. Coffey**, J.K. Howard, and K. Barmak, p. 205-11 in *Magnetic Ultrathin Films: Multilayers and Surfaces, Interfaces and Characterization*, eds. B.T. Jonker et al, Material Research Society, Pittsburgh, PA, 1993.
- 20) "Grain boundary diffusion controlled precipitation as a model for thin film reactions," K. Barmak and **K. R. Coffey**, p. 51-6 in *Phase Transformations in Thin Films - Thermodynamics and Kinetics*, eds. M. Atmon, A.L. Greer, J.M.E. Harper, and M. Libera, Material Research Society, Pittsburgh, PA, 1993.
- 21) "Stress measurements in materials for magnetic recording," V. Raman, **K. R. Coffey**, R. Umphress, and J.K. Howard, p. 15-20 in *Thin Films; Stresses and Mechanical Properties IV*, Material Research Society, Pittsburgh, PA, 1993.

- 22) "Effect of microstructure on phase formation in the reaction of Nb/Al multilayer thin films," K. Barmak, **K. R. Coffey**, D.A. Rudman, and S. Foner, p. 61-6 in *Phase Transformation Kinetics in Thin Films*, eds. M. Chen, M.O. Thompson, R.B. Schwarz, and M. Libera, Material Research Society, Pittsburgh, PA, 1991.
- 23) "First phase formation kinetics in the reaction of Nb/Al," **K. R. Coffey**, K. Barmak, D.A. Rudman, and S. Foner, p. 55-60 in *Phase Transformation Kinetics in Thin Films*, eds. M. Chen, M.O. Thompson, R.B. Schwarz, and M. Libera, Material Research Society, Pittsburgh, PA, 1991.

PUBLICATIONS: CONFERENCE PRESENTATIONS SINCE JOINING UCF

1. **K. R. Coffey**, T. Thomson, and J.-U. Thiele, 47th Annual Conference on Magnetism and Magnetic Materials – Tampa, Florida, November 11-15, 2002, “Angle dependent magnetization reversal of thin film magnetic recording media.”
2. **K. R. Coffey**, T. Thomson, and J.-U. Thiele, Intermag 2003 – Boston, MA, March 30-April 3, 2003, “Angle dependent switching of granular and multilayer perpendicular media.”
3. **K.R. Coffey**, J.-U. Thiele, and T. Thomson, 9th Joint MMM/Intermag Conference, January 5-9, 2004, Anaheim, CA, “Temperature dependence of the magnetization reversal of thin film longitudinal magnetic recording media.”
4. S. Srinath, N. A. Frey, R. Heindl, H. Srikanth, **K. R. Coffey**, and N. J. Dudney, 49th Conference on Magnetism and Magnetic Materials, November 7-11 2004, Jacksonville, Florida, “Growth and characterization of sputtered BSTO/BaM multilayers.”
5. P. R. Gadkari, A. P. Warren, R. M. Todi, R. V. Petrova, **K. R. Coffey**, AVS 51st International Symposium & Exhibition – Anaheim, CA November 14-19 2004 “Comparison of the Agglomeration Behavior of Thin Metallic Films on SiO₂”.
6. R. V. Petrova, R. R. Vanfleet, D. Richardson, B. Yao and **K.R. Coffey**, “Intermag 2005, Nagoya, Japan, April 4-8 2005, Characterization of individual L1₀FePt nanoparticles.”
7. R. M. Todi, P. R. Gadkari, K. B. Sundaram, **K. R. Coffey**, 207th Meeting of the ECS - Quebec City, Canada, May 15-20, 2005 “Work function studies for Pt-Ru alloy thin films”.
8. R. V. Petrova, R. R. Vanfleet, D. Richardson, B. Yao and **K.R. Coffey**, Microscopy and Microanalysis Meeting, Honolulu, Hawaii, August 2005, “Convergent beam electron diffraction of ordered L1₀ nanoparticles”
9. R. V. Petrova, R. R. Vanfleet, V. Lam, B. Yao and **K.R. Coffey**, 50th Magnetism and Magnetic Materials Conference, San Jose, California, October 30 – November 3, 2005, “Particle-to-particle variation of the order parameter of FePt L1₀ nanoparticles.”
10. B. Yao, R. V. Petrova, R. R. Vanfleet, **K. R. Coffey**, 50th Magnetism and Magnetic Materials Conference, San Jose, California, October 30 – November 3, 2005, “Compositional stability of FePt nanoparticles on SiO₂/Si during annealing.”
11. R. M. Todi, K. B. Sundaram, **K. R. Coffey**, 13th International Workshop on the Physics of Semiconductor Devices – New Delhi, India, December 13-17, 2005 “Work Function for Pt-Ru Alloy Metal Gate Electrode for PMOS”.
12. R. V. Petrova, R. R. Vanfleet, V. Lam, B. Yao and **K.R. Coffey**, March Meeting of the American Physical Society, Baltimore Maryland, March 2006, “Variability in the extent of ordering for individual FePt L1₀ nanoparticles.”
13. R. M. Todi, K. B. Sundaram, K. Barmak, **K. R. Coffey**, 2006 MRS Spring Meeting, April 17-21, San Francisco, CA, “Comparison of the Work Function of Pt-Ru Binary Metal Alloys Extracted from Metal-Oxide-Semiconductor Capacitors and Schottky Barrier Diodes”.
14. A. Vijayakumar, R. M. Todi, K. B. Sundaram, **K. R. Coffey**, 2006 MRS Spring Meeting, April 17-21, San Francisco, CA, “High Temperature Characterization of RF Sputtered Silicon Carbon Nitride Thin Films”.

15. A. Vijayakumar, R. M. Todi, K. B. Sundaram and **K. R. Coffey**, 209th Meeting of the ECS – Denver, CO, May 7-11, 2006 “Investigation of Reactively Sputtered SiCBN Thin Film”.
16. R. M. Todi, M. Erickson, K. B. Sundaram and **K. R. Coffey**, 210th Meeting of the ECS – Cancun, Mexico, October-29 – November 3, 2006, “Temperature Dependent Work-Function Characteristics of Pt-Ru Schottky Diode”.
17. A. Vijayakumar, R. M. Todi, M. Erickson, K. B. Sundaram and **K. R. Coffey**, 210th Meeting of the ECS – Cancun, Mexico, October-29 – November 3, 2006, “High Temperature Annealing Characterization of Reactively Sputtered SiCBN Thin Films”.
18. R. M. Todi, K. B. Sundaram and **K. R. Coffey**, CODEC – Kolkata, India, December 18-20, 2006 “Work Function Engineering: Band Edge Metals for PMOS”.
19. B. Yao, T. Sun, A. P. Warren, **K. R. Coffey**, V. Kumar, S. Roberts, T. Shyu, K. Barmak, 2007 SRC-GRC/NYCAIST, Albany, NY, 10/21/2007~10/23/2007. “Transmission electron microscopy characterization of Cu films for quantitative determination of surface and grain boundary scattering contribution to electron resistivity”
20. B. Yao, K. R. Coffey. 52nd Magnetism and Magnetic Materials Conference, Tampa, FL, November 5-9, 2007. “The effective interdiffusivity, structure and magnetic properties of [Fe/Pt]_n multilayer films,”
21. B. Yao, **K. R. Coffey**, 2007 Fall Meeting of the Materials Research Society, Boston, MA, November 26 - 30, 2007. “Determination of the L10 FePt phase fraction of annealed FePt thin films using hollow cone dark field transmission electron microscopy,”
22. T. Sun, B. Yao, A. P. Warren, **K. R. Coffey**, K. Barmak. 2007 SRC-GRC/NYCAIST, Albany, NY, 10/21/2007~10/23/2007. "Methodology for independent measurement of surface and grain boundary electron scattering,"
23. T. Sun, B. Yao, A. P. Warren, **K. R. Coffey**, K. Barmak, AVS 54th International Symposium and Exhibition. 10/14/07-10/19/07, Seattle, WA, "Methodology for independent measurement of surface and grain boundary electron scattering,"
24. A. P. Warren, T. Sun, B. Yao, M. F. Toney, K. Barmak, **K. R. Coffey**, 2007 SRC-GRC/NYCAIST, Albany, NY, 10/21/2007~10/23/2007. “Synchrotron X-ray Scattering of Cu Films and Lines,”
25. A. P. Warren, R. M. Todi, B. Yao, K. B. Sundaram, K. Barmak, **K. R. Coffey**, AVS 54th International Symposium and Exhibition. 10/14/07-10/19/07, Seattle, WA, “Structural Characterization and Electronic Work Function of Pt-Ru Alloy Thin Films”
26. A. P. Warren, R. M. Todi, B. Yao, K. B. Sundaram, K. Barmak, **K. R. Coffey**, Joint Symposium of the Florida Chapter of the AVS and the Florida Society for Microscopy, 03/12/07-03/13/07, Orlando, FL, “Phase Identification of DC Magnetron Sputtered Pt-Ru Alloy Thin films by X-ray and Electron Diffraction”
27. D. Shelton, T. Sun, V.R. D'Costa, J. Menendez, **K.R. Coffey** and G.D. Boreman, Spring Meeting of the Materials Research Society, 3/24/08-3/28/08, San Francisco, CA, “Anomalous Infrared Conductivity Effects in Noble Metallic Thin Films Characterized by Spectroscopic Ellipsometry.”
28. B. Yao and **K. R. Coffey**, 53rd Annual Conference on Magnetism and Magnetic Materials (MMM), Austin, TX. Nov. 10-14, 2008, “The formation of the FePt L10 phase from [Fe/Pt]_n multilayer films.”

29. T. Sun, A. Warren, B. Yao, **K.R. Coffey**, V. Kumar, K. Barmak, M.F. Toney, March Meeting of the American Physical Society, March 10-14, 2008, New Orleans, LA, "The classical size effect: Impact of grain boundaries on resistivity in encapsulated Cu thin films."
30. B. Yao and **K. R. Coffey**, IEEE Magnetics Society Summer School, Colorado Springs, Colorado . Aug. 02-09, 2008, "Heat treatment of [Fe/Pt]_n multilayer thin films for L10 FePt and its exchange spring magnets."
31. P. D. Mani, D. Shelton, K. R. Coffey, A. Vijayakumar, and J. R. Pitts, 215th meeting of the Electro-Chemical Society, May 24-29, 2009, San Francisco, CA, "Reactive sputter deposition of Lithium phosphorus oxy-nitride thin films."
32. T. Sun, B. Yao, A. Warren, V. Kumar, K. Barmak, K.R. Coffey, Interconnect Technology Conference, June 1-4, 2009, San Francisco, CA, "Resistivity Size Effect in Encapsulated Cu Thin Films."
33. D. Shelton , J. Ginn, K. Coffey, and G. Boreman, Spring Meeting of the Materials Research Society, April 13-17, 2009, San Francisco, CA, "Infrared photoconductivity in heavily nitrogen doped a-Si:H."
34. D. Choi, T. Sun, A. P. Warren, B. Yao, A. Darbal, K. Barmak, M. F. Toney, R. E. Peale, and K. R. Coffey, March Meeting of the American Physical Society, March 16–20, 2009; Pittsburgh, Pennsylvania, "Classical size effect in nanometric Cu films: the dominant role of grain boundary scattering."
35. K. Barmak, A. Darbal, T. Nuhfer, D. J. Dingley, G. Meaden, J. Michael, T. Sun, B. Yao, K. R. Coffey, March Meeting of the American Physical Society, March 16–20, 2009, Pittsburgh, Pennsylvania, "Crystal Orientation Imaging of Nanometric Metal Films in the Transmission Electron Microscope"
36. P. Warren, B. Yao, T. Sun, K. Barmak, M. F. Toney, K. R. Coffey, Spring Meeting of the Materials Research Society, April 13-17, 2009, San Francisco, CA, "X-ray scattering study of interface evolution and Grain Growth in Encapsulated Cu films."
37. T. Sun, B. Yao, A. Warren, D. Choi, A. Darbal, V. Kumar, K. Barmak, M. F. Toney, R. E. Peale, K. R. Coffey, Spring Meeting of the Materials Research Society, April 13-17, 2009, San Francisco, CA, "Dominant role of grain boundary scattering in the resistivity of encapsulated Cu films."
38. K. Barmak, A. Darbal, T. Nuhfer, D. J. Dingley, G. Meaden, J. Michael, T. Sun, K. R. Coffey, Spring Meeting of the Materials Research Society, April 13-17, 2009, San Francisco, CA, "Orientation Imaging of Nanocrystalline Copper and Platinum Films in the Transmission Electron Microscope"
39. K. Barmak, A. D. Rollett, T. Sun, S. Roberts, T. Shyu, F. Uyar, I. Livshits, E. Eggeling, D. Kinderlehrer, G. S. Rohrer, S. Ta'asan, K. R. Coffey, J. M. Rickman, B. Radakrishnan, Spring Meeting of the Materials Research Society, April 13-17, 2009, San Francisco, CA, "Simultion of Interconnect Microstructures".
40. (Oral) A. Darbal, K. Barmak, N. T. Nuhfer, D. Dingley, G. Meadon, T. Sun, K. R. Coffey, J. Michael, Microscopy and Microanalysis, Richmond, July 2009, "Orientation Imaging of Nanocrystalline Cu and Pt Thin Films in the Transmission Electron Microscope (TEM-OIM via ACT)."

41. S. Brennan, A. P. Warren, K. R. Coffey, N. Kulkarni, P. Todd, Y. Sohn, M. Klimov, Gordon Research Conference, August 2-7 2009; Andover, New Hampshire "Tracer Diffusion Studies in Magnesium"
42. D. Peters, D. Shelton, J. Ginn, M. Sinclair, G. Ten-Eyck, J. Wendt, W. Langston, L. Basilio, L. Warne, B. Passmore, and G. Boreman, 3rd International Congress on Advanced Electromagnetic Materials in Microwaves and Optics, September 2009, "Effect of Oxide Layers on the Performance of Split Ring Resonator Metamaterials."
43. T. Sun, A. P. Warren, B. Yao, K. Barmak, M. F. Toney, K. R. Coffey, Advanced Metallization Conference, Oct 13-15, 2009, Baltimore, Maryland, "Quantitative analysis of the impact of surface and grain boundary scattering on the resistivity of nanometric Cu films."
44. A. P. Warren, T. Sun, B. Yao, K. Barmak, M. F. Toney, K. R. Coffey, Advanced Metallization Conference. Oct 13-15, 2009, Baltimore, Maryland, "Evolution of Cu/ SiO₂ and Cu/Ta interface roughness with annealing."
45. K. Barmak, A. Darbal, T. Nuhfer, D. J. Dingley, G. Meaden, J. Michael, T. Sun, B. Yao, K. R. Coffey, The Twelfth Frontiers of Electron Microscopy (FEMMS), Sept 27-Oct 2, 2009, Sasebo, Japan, "Orientation Imaging of Nanocrystalline Platinum Films in the TEM."
46. P. Mani, D. Shelton, K. R. Coffey, A. Vijayakumar and J. R. Pitts, "Reactive sputter deposition of lithium phosphorus oxynitride thin films", 215th Electrochemical Society meeting at San Francisco, May 2009.
47. S. Brennan, A. P. Warren, M. Klimov, K. R. Coffey, Y. Sohn, N. Kulkarni, P. Todd, Materials Science and Technology Conference 2009, October 25-29, 2009: Pittsburgh, Pennsylvania, "Experimental Determination of Aluminum, Zinc and Manganese Impurity Diffusion Coefficients in Magnesium"
48. T. Sun, B. Yao, A. P. Warren, K. Barmak, M. F. Toney, R. E. Peale, K. R. Coffey, Materials Science and Technology Conference 2009, October 25-29, 2009: Pittsburgh, Pennsylvania, "Dominant Role of Grain Boundary Scattering in the Resistivity of Nanometric Cu Films"
49. Bo Yao, Tik Sun, Andrew Warren, Kevin Coffey, Katayun Barmak, Materials Science & Technology 2009, Pittsburgh, PA, October 25-29, 2009. "High contrast hollow-cone dark field transmission electron microscopy for nanocrystalline grain size quantification."
50. "Tracer Diffusion Studies of Magnesium and Zinc in Mg-Al-Zn Alloys," S. Brennan, A.P. Warren, K.R. Coffey, Y.H. Sohn, N. Kulkarni, P. Todd, 2010 TMS Annual Meeting & Exhibition: Symposium on Magnesium Technology 2010, February 14-18, 2010, Seattle, WA, U.S.A..
51. P. Mani, M. R. Robert, S. Duranceau, K. R. Coffey, A. Vijayakumar, "Characterization of reactively sputter deposited lithium phosphorus oxynitride thin films", 218th Electrochemical Society meeting, Las Vegas, October 2010.
52. "Isotopic Diffusion Database for Mg ICME," N. Kulkarni, P. Todd, Y.H. Sohn, K.R. Coffey, S. Brennan, J. Hunter, U.S. Automotive Materials Partnership Integrated Computational Materials Engineering (UAMP-IMCE) for Magnesium Program Workshop, April

30-31, 2010, U.S. Council for Automotive Research (USCAR) LLC, Southfield, MI, USA. (Invited).

53. "Self-Diffusion Studies in Magnesium using Secondary Ion Mass Spectroscopy," N. Kulkarni, P. Todd, Y.H. Sohn, S. Brennan, K. Coffey, M. Klimov, G.E. Murch, I. Belova, Symposium on Phase Stability, Diffusion, Kinetics and Their Applications (PSDK-V), Materials Science & Technology 2010 (MS&T2010), October 17-21, 2010, Houston, Texas, USA.
54. " Synchrotron X-ray Scattering Investigation of Thin Film Interface Kinetics," Warren AP, Toney MF, Barmak K, Kravchenko II, Coffey KR. Spring Meeting of the International Centre For Diffraction Data, Newtown Square, PA. March 2012 (Invited).
55. "Synchrotron X-ray Scattering Investigation of Morphological Stability of Cu Thin Film Interfaces," A.P. Warren, M.F. Toney, K. Barmak, I.I. Kravchenko, K.R. Coffey, AVS 59th Annual International Symposium, Tampa, FL, 10/28 to 11/2, 2013.
56. "High Throughput Crystal Orientation Mapping of Nanometric Cu: Impact of Surface and Grain Boundary Scattering on Electrical Resistivity," X. Liu, A. Darbal, K. Ganesh, G. Rohrer, D. Choi, P. Ferreira, B. Yao, T. Sun, A.P. Warren, M.F. Toney, K.R. Coffey, K. Barmak, AVS 59th Annual International Symposium, Tampa, FL, 10/28 to 11/2, 2013.
57. "Crystal Orientation Mapping of Nanometric Cu Films: Impact of Surface and Grain Boundary Scattering on Electrical Resistivity," X. Liu, T. Sun, B. Yao, A. P. Warren, M. F. Toney, R. E. Peale, K. R. Coffey, and K. Barmak, Spring Meeting of the Materials Research Society, San Francisco, CA, April 1-5, 2013.

PUBLICATIONS: ISSUED U.S. PATENTS

- 1) US Patent 5,452,163; Issued 09/19/1995, "Multilayer magnetoresistive sensor." Inventors: **Coffey, Kevin R.**; Fontana, Robert E.; Howard, James K.; Hylton, Todd L.; Parker, Michael A.; Tsang, Ching H..
- 2) US Patent 5,476,680; Issued 12/19/1995, "Method for manufacturing granular multilayer magnetoresistive sensor." Inventors: **Coffey, Kevin R.**; Howard, James K.; Hylton, Todd L.; Parker, Michael A..
- 3) US Patent 5,583,725; Issued 12/10/1996, "Spin valve magnetoresistive sensor with self-pinned laminated layer and magnetic recording system using the sensor." Inventors: **Coffey, Kevin R.**; Gurney, Bruce A.; Heim, David E.; Lefakis, Haralambos; Mauri, Daniele; Speriosu, Virgil S.; Wilhoit, Dennis R..
- 4) US Patent 5,729,200; Issued 03/17/1998, "Magnetomechanical electronic article surveillance marker with bias element having abrupt deactivation/magnetization characteristic." Inventors: Copeland, Richard L.; **Coffey, Kevin R.**
- 5) US Patent 5,867,101; Issued 02/02/1999, "Multi-phase mode multiple coil distance deactivator for magnetomechanical EAS markers." Inventors: Copeland, Richard L.; Richter, John T.; **Coffey, Kevin R.**
- 6) US Patent 5,905,435; Issued 05/18/1999, "Apparatus for deactivating magnetomechanical EAS markers affixed to magnetic recording medium products." Inventors: Copeland, Richard L.; **Coffey, Kevin R.**
- 7) US Patent 5,949,334; Issued 09/07/1999, "Magnetostrictive element having optimized bias-field-dependent resonant frequency characteristic." Inventors: Lian, Ming-Ren; Liu, Nen-Chin; **Coffey, Kevin**; Copeland, Richard; Ho, Wing; O'Handley, Robert C..
- 8) US Patent 5,989,728; 11/23/1999, "Thin film magnetic recording medium having high coercivity." Inventors: **Coffey, Kevin Robert**; Howard, James Kent; Parker, Michael Andrew.
- 9) US Patent 5,999,098; Issued 12/07/1999, "Redistributing magnetic charge in bias element for magnetomechanical EAS marker." Lian, Ming-Ren; **Coffey, Kevin R.**; Lambeth; David.
- 10) US Patent 6,011,474; Issued 01/04/2000, "Multiple-use deactivation device for electronic article surveillance markers." Inventors: **Coffey, Kevin R.**; Ho, Wing K.; Copeland; Richard L..
- 11) US Patent 6,016,241; Issued 01/18/2000, "Magnetoresistive sensor utilizing a granular magnetoresistive layer." Inventors: **Coffey, Kevin Robert**; Howard, James Kent; Hylton; Todd Lanier; Parker; Michael Andrew..

- 12) US Patent 6,023,226; Issued 02/08/2000, "EAS marker with flux concentrators having magnetic anisotropy oriented transversely to length of active element." Inventors: Morin, Sylvie R.; Ho, Wing K.; **Coffey, Kevin R.**
- 13) US Patent 6,060,988; Issued 05/09/2000, "EAS marker deactivation device having core-wound energized coils." Inventors: Copeland, Richard L.; **Coffey, Kevin R.**
- 14) US Patent 6,181,245; Issued 01/30/2001, "Magnetomechanical electronic article surveillance marker with bias element having abrupt deactivation/magnetization characteristic." Inventors: Copeland, Richard L.; **Coffey, Kevin R.**
- 15) U.S. Patent 6,881,497; Issued 04/19/2005, "Thermal Spring Magnetic recording media for writing using magnetic and thermal gradients." Inventors: **Coffey, Kevin Robert**; Thiele, Jan-Ulrich; Weller, Dieter Klaus
- 16) US Patent 6,950,260; Issued 09/27/05, "Thermally assisted magnetic recording system and method of writing using magnetic and thermal gradients." Inventors: **Coffey, Kevin Robert**; Fontana, Jr., Robert Edward; Thiele, Jan-Ulrich
- 17) U.S. Patent 6,982,843; Issued 01/03/2006, "Assembly Comprising Adjustable heat flux mechanism for thermally assisted/thermal information processing and control." Inventors: **Coffey, Kevin Robert**; Hamann; Hendrik F.; Thiele, Jan-Ulrich; Wickramasinghe, Hemantha Kumar.
- 18) U.S. Patent 7,006,336; Issued 02/28/2006, "Magnetic head having a heater circuit for thermally-assisted writing." Inventors: **Coffey, Kevin Robert**; Lille, Jeffrey Scott; Tam, Andrew Ching.
- 19) U.S. Patent 7,164,358; Issued 01/16/2007, "Frequency divider with variable capacitance." Inventors: Lian, Ming-Ren; Todi; Ravi; **Coffey, Kevin**; Sundaram, Kalpathy; Gadkari, Parag.
- 20) U.S. Patent 7,170,174; Issued 01/30/2007, "Magnetic head having a heater circuit for thermally-assisted writing." Inventors: **Coffey, Kevin Robert**; Lille, Jeffrey Scott; Tam, Andrew Ching.
- 21) U.S. Patent 7,633,065; Issued 12/15/2009, "Conduction structure for infrared microbolometer sensors" Inventors: Lian, Ming-Ren; **Coffey, Kevin Robert**.
- 22) U.S. Patent 8,228,159; Issued 7/24/2012, "Nanocomposite semiconducting material with reduced resistivity," Inventors: **Coffey, Kevin Robert**; Lam, Vu Huynh; Dein, Edward; Warren, Andrew Peter; Boreman, Glenn; Zummo, Guy V.; Caba, Wilson
- 23) U.S. Patent 8,298,358; Issued 10/30/2012, "Ignitable heterogeneous structures and methods for forming," Inventors: **Coffey, Kevin Robert**; Dein, Edward; Yao, Bo.
- 24) U.S. Patent 8,333,854; Issued 12/18/2012, "Thermite compositions, articles and low temperature impact milling process for forming the same," Inventors: **Coffey, Kevin Robert**; Dein, Edward; Hugus, Dickson; Sheridan, Edward.

SCIENTIFIC IMPACT SUMMARY OF JOURNAL PUBLICATIONS

- **In the study of solid state reactions in thin films:**
 - Dr. Coffey introduced a new model for thin film reactions, which stressed the importance of grain boundary diffusion and nucleation barriers for product phase formation. Dr. Coffey has published 9 journal articles in this field. The most cited article is "Experimental evidence for nucleation during thin film reactions," K. R. Coffey, L. A. Clevenger, K. Barmak, D.A. Rudman, and C.V. Thompson, Applied Physics Letters, vol. 55, no. 9, p. 852-4, Aug. 1989. This article describes the unexpected observation of the presence of nucleation barriers for a strongly exothermic first phase formation between elemental precursors by calorimetric experiments. Dr. Coffey is currently investigating self-propagating reactions in nanoenergetic thin films, but has not yet published his recent contributions to this field.
- **In the study of electronic properties of thin films:**
 - Dr. Coffey introduced the intermetallic L1₀ alloys (FePt, CoPt) as a candidate materials system for magnetic recording media, due to their high magneto-crystalline anisotropy, and has published 11 journal articles in the field. His most heavily cited work in this field is "High anisotropy L1₀ thin films for longitudinal recording," K. R. Coffey, M. A. Parker, J. K. Howard, IEEE Transactions on Magnetics, vol. 31, no. 6, pt. 1, p. 2737-39, Nov. 1995, which provided the first magnetic recording data on this materials system. The study of pseudo-binary alloys to optimize thermo-magnetic properties in this system is reported in "Temperature dependent magnetic properties of highly chemically ordered Fe₅₅-xNiPt₄₅ L1₀ films," J.-U. Thiele, K. R. Coffey, M.F. Toney, J.A. Hedstrom, and A.J. Kellock, Journal of Applied Physics, Vol. 91, Issue 10, pp. 6595-6600, May 2002. His more recent research focuses on the poor chemical ordering observed in the smaller FePt nanoparticles (< 10 nm), and the quantitative determination of ordered fraction..
 - Dr. Coffey has also made significant contributions to the study of electronic transport in metallic thin films, publishing more than 12 journal articles in this field. The use of pre-coalescence nuclei of evaporated NiFe as nanoparticles interconnected by a continuous Cu overlayer is described in "Granular giant magnetoresistance at low fields in bilayer thin films," K. R. Coffey, T.L. Hylton, M.A. Parker, and J.K. Howard, Applied Physics Letters, vol. 63, no. 11, p. 1579-81, Sept. 1993. Significantly greater sensitivity was observed for multiple discontinuous magnetic layers in the heavily cited "Giant magnetoresistance at low fields in discontinuous NiFe-Ag multilayer thin films," T.L. Hylton, K. R. Coffey, M.A. Parker, and J.K. Howard, Science, vol. 261, no. 5124, p. 1021-4, Aug. 1993. His current efforts focus on the quantitative study of electron scattering as evidenced by "Dominant role of grain boundary scattering in the resistivity of nanometric Cu films," T. Sun, B. Yao, A.P. Warren, K. Barmak, M.F. Toney, R.E. Peale, and K.R. Coffey, Physical Review B, vol. 79, article 041402, 2009, and additional works in progress.

RESEARCH SUPERVISED

Doctor of Philosophy

1. Christopher Seth Hill, "Alternate Interconnect Metals," in progress from August of 2012.
2. Daniel Yates, "Nanoscale energetic materials," in progress from January 2009.
3. Vinit Todi, "Investigation of reactively sputtered BCN thin films," August 2011, Dr. Todi is currently employed with IBM Microelectronics.
4. Prabu Mani, "Ionic transport in amorphous oxide semiconductors," in progress from August 2007.
5. David Shelton, "Tunable Infrared Metamaterials," August, 2010. Dr. Shelton is the President of Plasmonics, Inc, a Central Florida startup company that he founded to explore the commercial applications of his doctoral research.
6. Andrew Warren, "Materials characterization using synchrotron X-ray scattering," May 2013. Dr. Warren accepted a position with a local startup, Plasmonics Inc.
7. Tik Sun, "Classical size effect in Cu thin films: Impact of surface and grain boundary scattering on resistivity" December, 2009. Dr. Sun is the President of Integrated Systems Ltd. In Hong Kong and Beijing.
8. Bo Yao, "On the study of [Fe/Pt]_n multilayer thin film reactions to form L10 FePt and its based exchange spring magnets," December, 2008. Dr. Yao is a post-doctoral researcher at Pacific Northwest National Laboratory.
9. Ravi Todi, "Gate Stack and Channel Engineering: Study of Metal Gates and Germanium Channel Devices," May, 2007. Dr. Todi is an Advisory Engineer with IBM Microelectronics in Fishkill, NY where he continues his interest in CMOS technology development.
10. Romyana Petrova, "Quantitative high-angle annular dark field scanning transmission electron microscopy for materials science," August, 2006. Dr. Petrova has taken permanent researcher position at the International Iberian Nanotechnology Laboratory, Portugal, where she applies her expertise in electron microscopy techniques to spintronics.

Master of Science

1. Mathew Erickson, "Reaction velocity in nanocomposite reactive thin films," August, 2009. Mr. Erickson is employed with Rockwell Collins in Melbourne, FL.
2. Vu Lam, "Electrical properties and magnetron sputter deposition of vanadium oxide amorphous semiconducting thin films," December, 2006. Mr. Lam accepted a position with Oerlikon Balzers Coating in St. Petersburg, FL, to continue his interest in vacuum processing of thin films.

3. Chaitali China, "Magnetic properties of sputter deposited Fe-based amorphous thin films for resonator application," August, 2006. Ms. China is currently working in the semiconductor industry with Micron Technology in Manassas, VA.
4. Ravi Todi, "Investigations on RF sputter deposited SiCN thin films for MEMS applications," December, 2005. Mr. Todi continued as a doctoral student at UCF.
5. Amruta Borge, "Giant magneto-impedance effect in thin layered structures," Ms. Borge is currently with Intel Corporation in Chandler, AZ.
6. Parag Gadkari, "Effect of annealing on copper thin films: the classical size effect and agglomeration," Mr. Gadkari is currently with NCR Corporation in Orlando, FL.

COURSEWORK AND TEACHING

Undergraduate: *Electronic Properties of Materials; EMA 4413*
 Electronic processes in solids. Electrical, magnetic, and optical properties of solids. Electron energies in solids. Superconducting materials.
 New course development. Elective course for materials track.
 Spring 2003: small class, one student response, "Excellent"
 Spring 2007: 72% of response in "Very Good" or "Excellent"

Structure and Properties of Materials; EGN 3365
 Atomic structure and bonding, crystal structure and imperfections, solidification, phase transformations, phase diagrams, heat treatment, mechanical & electrical properties, materials characterization techniques.
 Required course for all mechanical engineering students.
 Spring 2004: 38% of response in "Very Good" or "Excellent"

Structure and Properties of Aerospace Materials; EMA 3706
 Atomic structure and bonding, crystal structure and imperfections, solidification, phase transformations, phase diagrams, heat treatment, mechanical & electrical properties, materials characterization techniques.
 Required course for all aerospace engineering students.
 Fall 2008: 67% of response in "Very Good" or "Excellent"

Thermodynamics and Kinetics of Materials; EMA 4102
 Application of first, second and third laws of thermodynamics to materials, phase diagrams, statistical thermodynamics, kinetic processes in materials, diffusion, nucleation and growth, and phase transformations.
 New course development. Required course for materials track.
 Fall 2006: 93% of response in "Very Good" or "Excellent"

Experimental Techniques in Mechanics and Materials; EMA 3012C
 Lecture and laboratory sections to familiarize students with materials characterization techniques including microscopy, hardness, tensile, and impact testing.

Required course for all mechanical engineering students.
Spring 2009: 95% of responses in “Very Good” or “Excellent” for lecture session. Lab sections ranged from 82% to 100% of responses in “Very Good” or “Excellent”

Graduate:

Materials Science of Thin Films; EMA 5585

Interaction of thin film processing techniques with the structure and properties of the materials deposited.

New course development. Elective course.

Fall 2003: 84% of response in “Very Good” or “Excellent”

Fall 2004: 83% of response in “Very Good” or “Excellent”

Fall 2005: 80% of response in “Very Good” or “Excellent”

Materials Kinetics; EMA 5317

Mass and thermal transport, phase transformations and Arrhenius rate processes.

New course development. Required core course.

Spring 2005: 45% of response in “Very Good” or “Excellent”

Spring 2006: 60% of response in “Very Good” or “Excellent”

Spring 2008: 75% of response in “Very Good” or “Excellent”

Spring 2010: current teaching assignment.

Electronic Principles of Materials Properties; EMA 5415

Introduction to quantum physics and electron energies in solids.

Optical, electronic, magnetic, and thermal properties of solids.

New course development. Elective course.

Fall 2007: 83% of response in “Very Good” or “Excellent”

SERVICE ACTIVITIES

- External service activities:
 - ✓ Professional society memberships include: IEEE (Sr. Member), IEEE Electron Devices Society, IEEE Magnetics Society, American Physical Society and GMAG (Topical Group on Magnetism and its Applications), American Vacuum Society, Materials Research Society, and Sigma Xi
 - ✓ Reviewer/Referee for: National Science Foundation, Department of Energy, Journal of Applied Physics, IEEE Transactions on Magnetics, Journal of Materials Science, Journal of Electronic Materials, Applied Physics Letters, Thin Solid Films, Physica Status Solidi, Metallurgical and Materials Transactions A, Journal of Physics D: Applied Physics, Journal of Physics: Condensed Matter, Journal of Micromechanics and Microengineering, IEEE Potentials, Nanotechnology, Journal of Phase Equilibria and Diffusion
 - ✓ Publications editor for 2007 MMM/Intermag program committee
 - ✓ Co-chairman of the program committee for the 56th Conference on Magnetism and Magnetic Materials, October 30–November 3, 2011, Scottsdale, Arizona. Member of the program committees for: 55th Conference on Magnetism and Magnetic Materials, November 14–18, 2010, Atlanta, Georgia, 2007 Joint MMM/Intermag Conference, 53rd Conference on Magnetism and Magnetic Materials, 2009 International Magnetic Conference.
 - ✓ Session chair for MMM and Intermag conferences
 - ✓ Member of 2003-2013 organizing committee for the Joint Symposium of the Florida Chapter of the American Vacuum Society and the Florida Society for Microscopy
 - ✓ Treasurer of the Florida Chapter of the American Vacuum Society, 2004 -2013.

- Internal service activities:
 - ✓ Interim (founding) Chair of the Department of Materials Science and Engineering, 2012 to present.
 - ✓ Chair and member of several center and department faculty search committees
 - ✓ Member of Research Council of Faculty Senate, 2003-04 and 2004-05
 - ✓ Chair of Research Council of Faculty Senate, 2005-06
 - ✓ Member, UCF Commission on Nanotechnology 2003-04
 - ✓ Chair, AMPAC Space Allocation Committee, 2003-04
 - ✓ Graduate Program Coordinator, Materials Science and Engineering Ph.D. and M.S. degree programs, 2006-2011
 - ✓ Member of the UCF Graduate Appeals Committee, 2008-2011
 - ✓ Chair of the UCF Graduate Appeals Committee, 2009-2011
 - ✓ Faculty Advisor to UCF Student Chapter of the SAE, 2009-2011.
- Other community and K-12 service activities:
 - ✓ Participant, 2004 Summer Undergraduate Research Academy.
 - ✓ Participant, 2005 Florida-Georgia Louis Stokes Alliance for Minority Participation in Science, Engineering, and Mathematics Expo.
 - ✓ Judge, UCF Graduate Research Forum.
 - ✓ Judge, 2005 SAE AeroEast Competition.
 - ✓ Judge, 2004 SAE AeroEast Competition.
 - ✓ Mentor, Hrstina Petrova of University High School, support of her Science Fair activity (2nd Place in 2006 Orange County Science Fair).
 - ✓ Mentor, Nathan Jennings, student at Olympia High School, as part of the Siemens Westinghouse Honors Science Program. Nathan's interest in nanoscience and nanotechnology was encouraged.
 - ✓ Mentor, Martha Thorpe, a science teacher at Cocoa High School, during the summer of 2004 as part of the NSF Research Experience for Teachers (RET) program. This project involved the preparation of ultra-thin Au film samples that allowed Martha to demonstrate the mobility of atoms in solids to her students. This activity/interaction was supported significantly beyond the RET program. Mrs. Thorpe was nominated by Dr. Coffey to receive funding by the Florida Chapter of the American Vacuum Society (AVS) to attend the Teacher's Workshop held annually at the National AVS convention. As a workshop participant, Mrs. Thorpe received classroom demonstration equipment for basic vacuum science to use at Cocoa High School.
 - ✓ Mentor, Victor Bondzie, a science teacher at University High School, during the summer of 2006 as part of the NSF RET program. This project developed examples of Pd clusters for classroom description.