Curriculum Vitae – September 2017

Name: Martha R. McCartney

Current Position:

Professor, Department of Physics
Arizona State University, Tempe, AZ 85287-1504

Education: B.S., The Evergreen State College, Washington, 1983

Ph.D. (Physics), Arizona State University, August 1989
Thesis entitled "Observations of electron irradiation effects at transition-metal oxide surfaces"

Employment:

1984-1985 Teaching Assistant, Department of Physics, Arizona State University

1985-1989 Research Assistant, Department of Physics, Arizona State University

1989-1990 Postdoctoral Research Associate, Center for Solid State Science, Arizona State University

1990-1992 Postdoctoral Research Associate
1993-1994 Research Scientist
National Center for High Resolution Electron Microscopy, Arizona State University

1994-1998 Associate Research Scientist
1999-2005 Senior Research Scientist
Center for Solid State Science
Arizona State University

2005-2009 Associate Professor
Department of Physics and Astronomy
Arizona State University

2009- Professor
Department of Physics
Arizona State University

Memberships:

Microscopy Society of America
Materials Research Society
American Physical Society

Teaching:

Physics 334 Advanced Physics Lab. S2015 -
Physics 311 Classical Fields, Particles and Matter II S2006, S2007, S2008

Physics 310 Classical Fields, Particles and Matter I F2005, F2006, F2007
Physics 252 University Physics 3, F2009 - F2014

Instructor, Gatan Digital Microscopy School, February 1992
Instructor, Arizona State University Winter Schools for High Resolution Electron Microscopy, January 1987/1989-2017
Guest lecturer, MSE559 Advanced Electron Microscopy, Spring 1996-2014
Topics: Electron Holography (2 lectures) and Radiation Damage (1 lecture)
Lecturer, Quantitative Electron Microscopy School, St. Aygulf, France, May 2009.
Lecturer, Advanced Electron Microscopy School, Technical University of Denmark, July 2009.

Awards, Honors:

EMSA Presidential Scholar, 1988
Cosslett Award, Best Invited Paper, 2002 Microscopy & Microanalysis Mtg., Quebec City, Canada, Aug. 2002.
Otto Mønsted Guest Professorship, Technical University of Denmark, 2008
Ernst Ruska Prize, German Microscopy Society, 2009, for work on Electron Holography for Characterization of Magnetic Fields in sub-100nm-sized Materials and Devices
Faculty Achievement Award for Research in the Natural Sciences/Math from Arizona State University, 2011
Fellow, American Physical Society, 2012
Fellow, Microscopy Society of America, 2014

Professional Service:

Peer Review Committee, Chair, CSSS (1999-2002)
University Committee on Academic Professional Status, Co-chair (1999-2001)
CHREM User Committee, CSSS (2000-2003)
Graduate Exam Committee, Dept. of Physics (2005-2008, 2010-)
Personnel Committee, Dept. of Physics (2005- 2007)
Executive Committee, LeRoy Eyring Center for Solid State Science (2006-)
SPS faculty advisor, Dept. of Physics (2006-2008)
Graduate Program Committee, Department of Physics, (2008-12)
Personnel Committee, Chair, Department of Physics (2010 -12)
University Promotion and Tenure Committee (2011-2014)
Personnel Committee, Dept. of Physics (2014-
Awards Committee, Microscopy Society of America, (2010-2015)
Symposium Organizer, Microscopy and Microanalysis 2003, San Antonio, Aug. 4-8, 2003
Symposium Organizer, 14th European Microscopy Congress, Aachen, Germany Sept 1–5, 2008
Symposium Organizer, Microscopy and Microanalysis 2010, Portland, OR, August 1-4, 2010.
Symposium Organizer, International Microscopy Conference-17, Rio de Janeiro, Brazil, September 19-24, 2010.

Symposium Organizer, Microscopy and Microanalysis 2014, Hartford, CT, August 5-9, 2014.
Symposium Organizer, Microscopy and Microanalysis 2015, Portland, OR, August 2-6, 2015.
Co-chair Awards Committee for Microscopy Society of America 2014-2017.
Referee for Professional Journals including: Ultramicroscopy, Microscopy and Microanalysis, Applied Physics Letters, Surface Science, Journal of Microscopy, Journal of Applied Physics
Referee for Grant Proposals: Department of Energy, National Science Foundation
External Rapporteur for Doctoral Thesis of Ludvig de Knoop, Université Toulouse III, France 2014

Research Summary: 154 refereed publications, 11 book chapters, 3817 citations, h-index 35 (Google Scholar: 5514 citations, h-index: 41, i10-index: 111) 58 invited lectures at National/International conferences and 35 invited talks/seminars/colloquia at other institutions, 13 PhD students, 2 Master's students

Ph.D Students (Chair):

*Jing Li, "The Application of Off-Axis Electron Holography to Semiconductor Materials". 2001.
Hao Hu, "Study of Nanoscale Ferromagnetic Materials using Off-Axis Electron Holography", 2005
*Hua Wang, "Characterization of Magnetic Thin Films and Nanostructures", 2005
*Lin Zhou, "Microstructure Characterization of Nitride Thin Films and Heterostructures", 2006
Nipun Agarwal, "Characterization of Lithographically Patterned Magnetic Nanostructures", 2007
Myung-Geun Han, "Characterization of electrostatic potential of semiconductor devices using off-axis electron holography", 2007
Suk Chung, "Characterization of Electrostatic Potential of Compound Semiconductors Using Off-axis Electron Holography", 2009
David Cullen, "Characterization of GaN-based High Electron Mobility Transistor Devices", 2010
Kai He, "Quantitative Phase Imaging of Magnetic Nanostructures Using Off-axis Elecrtron Holography", 2010
Luying Li, "Determination of electrostatic potential and charge distribution of semiconductor nanostructures using off-axis electron holography". 2011
Michael Johnson, "TEM Characterization of Electrically Stressed High Electron Mobility Transistors" 2012
ZhaoFeng Gan, " Characterization of Electrostatic Potential and Trapped Charge in Semiconductor Nanostructures using Off- Axis Electron Holography" 2014
Desai Zhang, "Characterization of Magnetic Nanostructures Using Off-Axis Electron Holography" 2014

(* Designated as Co-Chair due to Graduate College stipulation)

Current Ph.D. students: Allison Boley Thomas McConkie. HsinWei Wu,

Undergraduate Honors Thesis advisor – R. Pennington, 2007, Aurora Ireland, 2017.

Committee member:

Ph.D. students - completed: J. Cai, M. Floyd, L. Gu, T. Leo, B. Ramadurai, U. Singisetti, C. Wang, Q. Spanola
- current Ph.D. students: S. Tobler, W. Zhou

M.S. Students - completed: P.S. Chakraborty, Q. Jiang

Visiting scholars supervised:

Dr. R.E. Dunin-Borkowski (University of Cambridge, England) - Jan. 1997- Jan. 1999.
H. Friedrich (Technical University of Dresden) - Sept. 2002- Aug. 2004.
Dr. M. Takeguchi (National Institute of Materials Science, Tsukuba) - Sept. 2002- Sept. 2003.
Dr. T. Fujita (JSPS Postdoctoral Fellow) - Sept. 2003 - Aug. 2005.
Dr. K. Yamamoto (JSPS Postdoctoral Fellow) - Sept. 2005 - Sept. 2006

Invited Lectures: 58 invited lectures at National/International conferences (in 16 countries on 5 continents) and 34 invited talks/seminars/colloquia at other institutions .

Invited Conference Lectures:

"Surface studies in UHV: applications of high-resolution electron microscopy", at 49th Ann. Meeting, Electron Microscopy Society of America, San Jose, CA, Aug. 8-11, 1991.

"Electron microscopy of electron stimulated processes at oxide surfaces", at Fifth International Workshop on Desorption Induced by Electronic Transitions, Taos, NM, April 1-4, 1992.

"Application of off-axis holography to the study of semiconductor junctions", at Frontiers of Electron Microscopy in Materials Science, Oakland, CA, June 21-24, 1994.

"Off-axis electron holography", at 52nd Ann. Meeting, Electron Microscope Society of America, New Orleans, LA, Aug. 8-11, 1994

"Electron holography of p-n junctions", at International Workshop on Electron Holography, Knoxville, TN, Aug. 29-31, 1994.

Fall Meeting, Materials Research Society, Boston, MA, Nov. 28 - Dec 2, 1994.

"Application of through-focal series restoration for resolution enhancement", at 53rd Ann. Meeting, Electron Microscopy Society of America, Kansas City, MO, Aug. 13-17, 1995.

"Electron holography and Lorentz microscopy of magnetic thin films and multilayers", at 15th Pfefferkorn Conference on Image and Signal Processing, Lake George, NY, May 18-22, 1996.

"Focal series reconstruction", at Frontiers of Electron Microscopy in Materials Science, Chicago, Ill., June 4-6, 1996.

"Resolution enhancement with through-focal series restoration" and "Electron holography and Lorentz microscopy of magnetic thin films and multilayers", at 5th Brazilian Conference on Microscopy of Materials, Rio de Janeiro, Brazil, October 13-16, 1996.

"Electron holographic imaging of magnetic materials", at Image Analysis Methods in Quantitative Electron Microscopy Workshop, Tegernsee, Germany, March 10-14, 1997.

"Electron holographic imaging of magnetic materials at nanometer scale resolution", at Microscopy and Microanalysis '97, 55th Ann. Meeting, Microscopy Society of America, Cleveland, OH, August 10-14, 1997.

"Electron holography of semiconductor junctions", at Microscopy and Microanalysis '98, 56th Ann. Meeting, Microscopy Society of America, Atlanta, GA, July 12-16, 1998.

"Electron holography of nanoscale magnetic particles and cross-sectional tunnel junctions", at 14th International Congress on Electron Microscopy, Cancun, Mexico, Aug. 31- Sept. 4, 1998.

"Quantitative electron holography of magnetic materials", at Microscopy and Microanalysis '99, 57th Ann. Meeting, Microscopy Society of America, Portland, OR, Aug 2-5, 1999.

"Dynamic electron holography of magnetic materials", at Workshop on Aberration Correction in Electron Microscopy, Argonne, IL, July 2000.

"Mapping electrostatic potential across a AlGaN/InGaN/AlGaN diode by electron holography" Workshop on Polarization Effects in Semiconductors, Glacier National Park, MT, August, 2000.

"Imaging in situ response to electrostatic and magnetic fields using electron holography", at Joint NSF-JSPS Workshop on Contribution of in situ electron microscopy to understanding and creation of advanced materials, Kyoto, Japan, November, 2000.

"Electron holography and applications to magnetic and electrostatic potentials", at Pan-American Advanced Studies Institute on Physics and Technology at the Nanometer Scale, Costa Rica, June 23 - July 2, 2001.

"Electron holography for characterization of electrostatic and magnetic nano-structures" at Beijing Conference "BCEIA", Beijing, China, Oct. 17-20, 2001.

"Electron holographic characterization of magnetic and electrostatic fields at the nanometer scale" at 7th International Symposium on Advanced Physical Fields", Tsukuba, Japan, Nov. 12-15, 2001.

"Electron holography of defects in GaN" at ONR Workshop on Extended defects in wide gap semiconductors: electrical and optical effects, San Pedro, Belize, Jan. 27-31, 2002.

"Electron holography for characterization of electrostatic and magnetic nano-structures" at Florida American Vacuum Society, Orlando, FL, March 11-12, 2002.

"Electron holographic imaging of electron beam-induced charging of insulating materials" at Symposium on Characterization of Non-Conductive or Charging Materials by Microbeam Analysis, McGill University, Montreal, Canada, Aug. 2-3, 2002

"Magnetic and structural characterization of biogenic magetite" at Microscopy and Microanalysis 2002, Quebec City, Quebec Canada, Aug. 4-8, 2002.

"Electron holographic characterization of nanoscale magnetic and electrostatic fields" at Microscopy and Microanalysis 2002, Quebec City, Quebec Canada, Aug. 4-8, 2002.

"Electron holographic characterization of nanoscale magnetic and electric fields" at 15th International Conference on Electron Microscopy, Durban, South Africa, Sept. 2-6, 2002.

"Electron holography for mapping charge distributions in wide gap semiconductors" at ONR Workshop on Defect Characterization Techniques for Wide Gap Semiconductors, Wailea, Hawaii, Mar. 16-20, 2003.

"Electron holography for 2-D dopant profiling" at Ultra-Shallow Junctions 2003, Santa Cruz, CA, Apr. 27- May 1, 2003.

"Electron holography of extended defects in wide gap semiconductors" at ONR Workshop on Extended Defects in Wide Gap Semiconductors, Irvington, VA, July 13-17, 2003.

"Electron holography and TEM characterization methods", at NSF First Industrial Workshop in Ceramics: Date Storage Technology, Washington, January 22-23, 2004.

"Electron holography of nanoscale electric and magnetic fields", at 8th Asia-Pacific Conference on Electron Microscopy, Kanazawa, Japan, June 8-11, 2004.

"Electron holography of electric fields at defects in semiconductors", at Gordon Research Conference on Defects in Semiconductors, Colby-Sawyer College, New Hampshire, July 18-23, 2004.

"Principles and practice of off-axis electron holography", at Microscopy and Microanalysis 2004, Savannah, Georgia, Aug. 1-5, 2004.

“Status of medium resolution off-axis electron holography”, at 2nd European Workshop on Electron Holography, Triebenberg, Germany, Aug. 29 – Sept. 01, 2004

“Imaging electrostatic and magnetic fields using electron holography” at the III Meeting of the Brazilian Materials Research Society, Iguassu Falls, Brazil, Oct. 10 – 14, 2004

"Electron holographic characterization of nanoscale magnetic and electrostatic fields", at 5th. Pacific Rim International Conference on Advanced Materials and Processing, Beijing, China, Nov. 2-5, 2004.

"Characterization of novel magnetic nanostructures", at Fall Meeting, Materials Research Society, Boston, Nov. 28 – Dec. 2, 2005

"Nanoscale imaging of electrostatic and magnetic fields by off-axis electron holography", at 16th. International Microscopy Congress, Sapporo, September 5-9, 2006

"Electron Holography of Electrostatic and Magnetic Fields" at Future of Electron Microscopy Workshop, Okinawa Institute of Science &Technology, Naha, Okinawa, Japan, March 27-30, 2007

"Electron Holography of Electrostatic and Magnetic Fields", Frontiers of Electron Microscopy in Materials Science 2007, Rohnert Park, CA, September 23-28, 2007

"Nanoscale imaging of electrostatic and magnetic fields ", Materials Research Society, Boston, MA, November 26-30, 2007

"Phase imaging of nanoscale magnetic and electric fields:, at 4th European Workshop on Electron Holography, Dresden, Germany, May 12-15, 2008.

"Nanoscale Imaging of Electric and Magnetic Fields by Off-axis Electron Holography",1st International Conference on Advanced Microscopy and Theoretical Calculations, Nagoya, Japan, June 29-30, 2008

"Nanoscale Imaging of Magnetic Fields by Off-axis Electron Holography", IOP Workshop on Magnetism, University of Leeds, UK, July, 2008.

"Nanoscale Imaging of Electric and Magnetic Fields by Off-axis Electron Holography", Nordic Microscopy Society Meeting – SCANDEM 2009, Reykjavik, Iceland, June 8-10, 2009.

"Quantitative Electron Holography of Magnetic Fields in Nanoscale Materials and Devices", Ernst Ruska Prize Lecture, Microscopy Conference 2009, Graz, Austria, Aug. 30 – Sept. 4, 2009.

"Nanoscale Imaging of Electric and Magnetic Fields by Off-axis Electron Holography", Beijing Conference and Exhibition on Instrumental Analysis, Beijing, China, Nov. 25-28, 2009.

"Nanoscale Imaging of Electric and Magnetic Fields by Off-axis Electron Holography", Nano 2010, Quito, Equador, June 7-11, 2010

"Nanoscale Imaging of Electric and Magnetic Fields by Off-axis Electron Holography", Tonomura FIRST International Workshop, Hatoyama, Japan, November 7, 2010.

"Nanoscale Imaging of Electric and Magnetic Fields by Off-axis Electron Holography", FEMMS2011, Sonoma, CA, September 2011.

"Nanoscale Imaging of Electric and Magnetic Fields by Off-axis Electron Holography", 26th New Zealand Conference on Microscopy, Christchurch, NZ February 2013.

"Electron Holography of Nanoscale Electric and Magnetic Fields", PICO 2103, Kasteel Vaalsbroek, Belgium Oct. 9-12, 2013.

"Electron Holography of Magnetic Fields at the Nanoscale", Present status and future trends in electron microscopy of magnetic structures, Halle, Germany, Oct. 2915.

"Electron Holography of Magnetic Fields at the Nanoscale", Hitachi Holography Workshop, Hatoyama, Japan Feb 2017.

"Precision in Measuring Wave Front Curvature Using Electron Holography", 620 WE-Hereaus-Seminar, Bad Honnef, Germany June 2016.

"Electron Holography of Magnetic Fields at the Nanoscale", Microscopy and Microanalysis, St Louis MO, Aug. 2017.

"Electron Holography of Nanoscale Electric and Magnetic Fields", YUCOMAT 2017, Herceg-Novi, Montenegro, Sept. 2017.

Invited research seminars, colloquia:

Hitachi Advanced Research Laboratory, Hatoyama, Japan, February, 1995.

Dept. of Materials Science, Kyushu University, Kyushu, Japan, March, 1995.

Phillips Applications Laboratory, Eindhoven, The Netherlands, December, 1995.

IFF Forschungzentrum, Jülich, Germany, 26 April, 1996.

University of Tübingen, Tübingen, Germany, 3 May, 1996.

Dept. of Materials Science, Carnegie Mellon University, Pittsburg, PA, 14 September, 1998.

Intel Advanced Characterization Group, Tempe, AZ, 4 February, 1999.

Center for Superconductivity, Houston, TX, 22 April, 1999.

CSSS Silver Jubilee Series, Arizona State University, Tempe, AZ, January, 2000.

AZ Imaging and Microanalysis Society, Tucson, AZ, February, 2000.

Dept. of Electrical and Computer Engineering, UC San Diego, La Jolla, CA, October, 2000.

Seagate Technology, Minneapolis, MN, February, 2001.

Motorola Semiconductor Products, Mesa, AZ, April, 2001

International SEMATECH, Austin, TX, May, 2001.

Dept. of Materials Science, Tsinghua University, Beijing, China, October 15, 2001.

CSSER Research Review, Mesa, AZ, Nov. 7, 2001

International SEMATECH, Austin, TX, Dec. 2-3, 2001

Department of Materials Science, Cambridge University, Cambridge, UK, July 18, 2002

International SEMATECH, Sunnyvale, CA, Dec. 12-13, 2002.

Dept. of Materials Science, Kyushu University, Kyushu, Japan, June, 2004.

Dept. of Materials Science, Wuhan University, Nov. 2004.

Grace Semiconductor, Shanghai, China, Nov. 2004.

Dept. of Electronics, Beijing University, Nov. 2004

Dept. Material Science and Engineering, Shanghai Jaio-Tong University, Nov. 2004.

Department of Physics and Astronomy, Arizona State University, Feb. 2005.

Instituto Potosino de Investigación Científica y Tecnológica (IPICyT), San Luis Potosi, July 2006.

IBM Almaden Research Center, San Jose, December 2006.

Centre d'Elaboration de Matériaux et d'Etudes Structurales (CEMES), Toulouse, France February, 2008.

Department of Materials Science, Changsha University, Changsha, China, Nov. 2009.

Brookhaven National Laboratory, Upton, NY, March 2010.

Aerospace Corporation, Los Angeles, CA, August 2010.

Simon Fraser University, Vancouver, BC, October 2011.

Stanford University, Palo Alto, CA, October 2012.

Argonne National Laboratory, Argonne IL, May 2013.

Pacific Northwest National Laboratory, Richland, WA, July 2013.

Kyushu University, Fukuoka, Japan, February, 2015.

University of Texas - San Antonio, TX, February 2015.

Arizona State University, APS-Four Corners Meeting, Oct 2015.

Publications

Book Chapters:

D. J. Smith and M. R. McCartney (1999) “Practical Electron Holography”, in: Introduction to Electron Holography, eds. E. Völkl, L. F. Allard, and D.C. Joy (Plenum Press, New York) Chapter 4, pp. 87-106.

D.J. Smith, W. J. de Ruijter, J. K. Weiss, and M. R. McCartney (1999) "Quantitative Electron Holography", in: Introduction to Electron Holography, eds. E. Völkl, L. F. Allard, and D.C. Joy (Plenum Press, New York) Chapter 5, pp. 107-124.

M.R. McCartney, R.E. Dunin-Borkowski, and D.J. Smith (2001) “Electron Holography and Its Application to Magnetic Materials”, in Magnetic Imaging and Its Application to Materials, eds. M. de Graef and Y. Zhu (Academic Press, San Diego) Chapter 4.

R. E. Dunin-Borkowski and M. R. McCartney (2002) " Off-axis Electron Holography of Nanostructured Magnetic Materials", in Magnetic Nanostructures, ed. H. S. Nalwa, (American Scientific Publishers, Stevenson Ranch, CA) Chapter 7.

M. A. Gribelyuk and M. R. McCartney, (2002) "Electron Holography of Semiconductor Structures: Principles and Recent Results", in Microelectronic Failure Analysis (ASM International, Materials Park, OH, 2002)

M.R. McCartney, R.E. Dunin-Borkowski, and D.J. Smith (2004) "Electron Holography of Magnetic Nanostructures", in Magnetic Microscopy of Nanostructures, eds. H. Hopster and H.P. Oepen (Springer) Chapter 5.

R.E. Dunin-Borkowski, M.R. McCartney and D.J. Smith (2004) "Electron Holography of Nanostructured Materials", in: Encyclopedia of Nanoscience and Nanotechnology, ed. H.S. Nalwa (American Scientific, Stevenson Ranch, CA) Vol. 3, pp. 41-100.

M.R. McCartney, R.E. Dunin-Borkowski, and D.J. Smith (2005) "Off-Axis Electron Holography", in: Microscopy for Nanotechnology, eds. N. Yao and Z.L. Wang (Springer-Verlag and Tsinghua University Press) Chapter 20.

D. J Smith, R E Dunin-Borkowski and M R McCartney (2005) “Nanoscale Structural and Magnetic Characterization using Electron Microscopy”, in Advanced Magnetic Nanostructures, eds. D J Sellmyer and R Skomski (Springer) Chapter 5.

R E Dunin-Borkowski, T Kasama, M R McCartney and D. J Smith (2007) “Electron Holography”, in Science of Microscopy, eds. P W Hawkes and J C H Spence (Springer) Vol II, Chapter 18.

M.R. McCartney and D.J. Smith (2008) “Electron Holography of Ferromagnetic Materials”, in Handbook of Magnetism and Advanced Magnetic Materials, eds. H. Kronmüller and S.S.P. Parkin (Wiley) Vol. 5, Chapter in press.

Refereed Publications:

The following papers have been cited a total of 3418 times, with a Hirsch factor of 35, according to ISI Web of Science (Sept., 2017).

Wu, H.W., Lu, S.R., Aoki, T., Ponath, P., Ekerdt, J.G ., Demkov, A.A., McCartney, M.R., Smith, D.J., Integration of ferroelectric BaTiO3 with Ge: The role of a SrTiO3 buffer layer investigated using aberration-corrected STEM, Appl. Phys. Lett., **110**, 252901.

Tang, C., Chang, C.Z., Zhao, G.J., Liu, Y.W., Jiang, Z.L., Liu, C.X., McCartney, M.R., Smith, D.J., Chen, T.Y., Moodera, J.S., Shi, J. (2017) Above 400-K robust perpendicular ferromagnetic phase in a topological insulator, Science Advances **3**, e1700307.

Smith, D.J., Wu, H.W., Lu, S.R., Aoki, T., Ponath, P., Fredrickson, K., McDaniel, M.D., Lin, E., Posadas, A.B., Demkov, A.A., Ekerdt, J., McCartney, M.R., Recent studies of oxide-semiconductor heterostructures using aberration-corrected scanning transmission electron microscopy, J. Materials Research, **32**, 912-920.

Smith, D.J., Lu, J., Aoki, T., McCartney, M.R., Zhang, Y.H. (2017) Observation of compound semiconductors and heterovalent interfaces using aberration-corrected scanning transmission electron microscopy, J. Materials Research **32**, 921-927.

Lu, S., Kormondy, K.J., Ngo, T.Q., Aoki, T., Posadas, A., Ekerdt, J.G., Demkov, A.A., McCartney, M.R., and Smith, D.J. (2016) Spectrum and phase mapping across the epitaxial γ-Al_2O_3/$SrTiO_3$ interface, Appl. Phys. Lett. **108**, 051606.

Gan, Z., Gu, M., Tang, J., Wang, C.-Y., He, Y., Wang, K.L., Wang, C., Smith, D.J., and McCartney, M.R. (2016) Direct mapping of charge distribution during lithiation of Ge nanowires using off-axis electron holography, Nano Lett. **16**, 3748-3753.

Aoki, T., Lu, J., McCartney, M.R., and Smith, D.J. (2016) Bright-field imaging of compound semiconductors using aberration-corrected scanning transmission electron microscopy, Semicond. Sci. Technol. **31**, 094002.

Gan, Z., Perea, D.E., Yoo, J., He, Y., Colby, R.J., Barker, J.E., Gu, M., Mao, S.X., Wang, C., Picraux, S.T., Smith, D.J., and McCartney, M.R. (2016) Characterization of electrical properties in axial Si-Ge nanowire heterojunctions using off-axis electron holography and atom-probe tomography, J. Appl. Phys. **120**, 104301.

Ren, F., Pearton, S.J., Ahn, S., Lin, Y.-H., Machuca, F., Weiss, R., Welsh, A., McCartney, M.R., Smith, D.J., and Kravchenko, I. (2016) Evaluation of AlGaN/GaN high electron mobility transistors grown on ZrTi buffer layers with sapphire substrates, J. Vac. Sci. Technol. B **34**, 051208.

Ponath, P., Fredrickson, K., Posadas, A.B., Ren, Y., Wu, X., Vasudevan, R.K., Okatan, M.B., Aoki, T., McCartney, M.R., Smith, D.J., Kalinin, S.V., Lai, K., and Demkov, A.A. (2015) Carrier density modulation in a germanium heterostructure by ferroelectric switching, Nature Comm. 6, 6067.

Kormondy, K.J., Posadas, A.B., Ngo, T.Q., Lu, S., Goble, N., Jordan-Sweet, J., Gao, X.P.A., Smith, D.J., McCartney, M.R., Ekerdt, J.G., and Demkov, A.A. (2015) Quasi-two-dimensional electron gas at the epitaxial alumina/$SrTiO_3$ interface: Control of oxygen vacancies, J. Appl. Phys. 117, 095303.

Zhang, D., Shaw, J.M., Smith, D.J., and McCartney, M.R. (2015) Domain structure and perpendicular magnetic anisotropy in Co/Pd multilayers using off-axis electron holography, J. Magn. Magn. Mater. 388, 16-21.

Shen, X.-M., He, Z.-Y., Liu, S., Lin, Z.-Y., Zhang, Y.-H., Smith, D.J., and McCartney, M.R. (2015) An indirect method of studying band alignments in nBn photodetectors using off-axis electron holography, Appl. Phys. Lett. 107, 122109.

Gan, Z., Ahn, S., Yu, H., Smith, D.J., and McCartney, M.R. (2015) Measurement of mean inner potential and inelastic mean free path of ZnO nanowires and nanosheet, Maters. Res. Exp. 2, 105003.

Gan, Z., DiNezza, M., Zhang, Y.-H., Smith, D.J., and McCartney, M.R. (2015) Determination of mean inner potential and inelastic mean free path using off-axis electron holography and dynamical effects affecting phase determination, Microsc. Microanal. 21, 1406-1412.

R. E. Pimpinella, D. Zhang[2] M. R. McCartney[2] D. J. Smith, K. L. Krycka, B. J. Kirby, B. J. O'Dowd, L. Sonderhouse, J. Leiner, X. Liu, M. Dobrowolska, and J. K. Furdyna, "Magnetic properties of GaAs/Fe core/shell nanowires" J. Appl Phys. 113, 17B520 (2013).

David J. Smith, Toshihiro Aoki, John Mardinly, Lin Zhou and Martha R. McCartney, "Exploring aberration-corrected electron microscopy for compound semiconductors", Microscopy 62, S65-S73 (2013).

Li, L., Jin, L., Wang, J., Smith, D.J., Yin, W.-J., Yan, Y., Sang, H., Choy, W.C.H., and McCartney, M.R. (2012) Polarization-induced charge distribution at homogeneous zincblende/wurtzite heterostructural junctions in ZnSe nanobelts, Adv. Maters. 24, 1328-1332.

Zhou, L., Gonschorek, M., Giraud, E., Fetlin E., Carlin, J.F., Grandjean, N., Smith, D.J., and McCartney, M.R. (2012) Measurement of polarization-induced electric fields in GaN/AlInN quantum wells, Appl. Phys. Lett. 101, 251902.

L. Li, D. J. Smith, E. Dailey, P. Madras, J. Drucker and M.R. McCartney, (2011)" Observation of hole accumulation in Ge./Si core/shell nanowires using off-axis electron holography", Nano Letters, **11**, 293-297.

L. Zhou, D. J. Smith, M. R. McCartney, et al., (2011) "Measurement of electric field across individual wurtzite GaN quantum dots using electron holography", Applied Physics Letters, **99** #101905.

S. Chung, R. A. Berechman, M. R. McCartney, M. Skowronski, (2011) "Electronic Structure Analysis of Threading Screw Dislocations in 4H-SiC Using Electron Holography, Journal of Applied Physics, **109**, #034906.

L. Zhou, M.R. McCartney, D.J Smith, (2010) "Observation of dodecagon-shape V-defects in GaN/AlInN multiple quantum wells", Applied Physics Letters, **97**, Art. #161902.

(invited review) D.J. Smith, D.A. Cullen, L. Zhou, and M.R. McCartney, "Applications of TEM imaging, analysis and electron holography to III-nitride HEMT devices", Microelectronics Reliability, **50**, 1514-1519.

K. Yamamoto, Y. Sugawara, M.R. McCartney, and D.J. Smith (2010) "Phase-shifting electron holography for atomic image reconstruction", Journal of Electron Microscopy **59**, S81-S88.

(invited review) M. R. McCartney, N. Agarwal, S. Chung, D. A. Cullen, M-G. Han, K. He, Luying Li, H. Wang, L. Zhou, D. J. Smith, (2010), "Quantitative phase imaging of nanoscale electrostatic and magnetic fields using off-axis electron holography", Ultramicroscopy, **110**, 375-382.

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