

**Publications from UW-Madison College of Engineering for PIs Making Use of
the UW Electron Microprobe in the period 1994-2013
(note: currently only shows 4 of more than 20 PIs)**

Chang-Beom Eom Group Publications 2001-2013

1. “Artificially engineered superlattices of pnictide superconductor” S. Lee, C. Tarantini, P. Gao, J. Jiang, J. D. Weiss, F. Kametani, C. M. Folkman, Y. Zhang, X. Q. Pan, E. E. Hellstrom, D. C. Larbalestier, and C. B. Eom, *Nature Materials*, **in press** (2013)
2. “Epitaxial Integration of Perovskite-based Multifunctional Oxides on Silicon”, S.H. Baek, C.B. Eom, *Acta Materialia*, **in press** (2012)
3. “Active Control of Ferroelectric Switching Using Defect-Dipole Engineering”, D. Lee, B.C. Jeon, S.H. Baek, S.M. Yang, Y.J. Shin, T.H. Kim, Y.S. Kim, J.G. Yoon, C.B. Eom, and T.W. Noh, *Adv. Mat*, **24**, 6490 DOI:10.1002/adma.201203101 (2012)
4. “Artificial and Self-assembled Vortex-pinning Centers in Superconducting Ba(Fe_{1-x}Co_x)(2)As₂ Thin Films as a Route to Obtaining Very High Critical-Current Densities” C. Tarantini, S. Lee, F. Kametani, J. Jiang, J.D. Weiss, J. Jaroszynski, C.M. Folkman, E.E. Hellstrom, C.B. Eom, D.C. Larbalestier, *Phys. Rev. B*, **86**, 214504, DOI: 10.1103/PhysRevB.86.214504 (2012)
5. “Continuous Control of Charge Transport in Bi-Deficient BiFeO₃ Films Through Local Ferroelectric Switching”, T.H. Kim, B.C. Jeon, T. Min, S.M. Yang, D. Lee, Y.S. Kim, S.H. Baek, W. Saenrang, C.B. Eom, T.K. Song, J.G. Yoon, and T.W. Noh, *Adv. Funct. Mater.*, DOI: 10.1002/adfm.201201490 (2012)
6. “Mechanically-Induced Resistive Switching in Ferroelectric Tunnel Junctions” H. Lu, D.J. Kim, C.W. Bark, S. Ryu, C.B. Eom, E.Y. Tsymbal, A. Gruverman, *Nano Letters*, **12**, 6289, DOI: 10.1021/nl303396n (2012)
7. “Ferroelectric Tunnel Memristor”, D.J. Kim, H. Lu, S. Ryu, C.W. Bark, C.B. Eom, E.Y. Tsymbal, A. Gruverman, *Nano Letters*, **12**, 5697, DOI: 10.1021/nl302912t (2012)
8. “Thin Film Piezo MEMS”, Chang-Beom Eom and Susan Trolier-McKinstry (Guest editors of November 2012 issue), *MRS Bulletin*, **37**, 1007, DOI: 10.1557/mrs.2012.273 (2012)
9. “Reliable polarization switching of BiFeO₃”, S.H. Baek and C.B. Eom, *Phil. Trans. R. Soc. A*, **370**, 4872 (2012)
10. “Evidence for charge–vortex duality at the LaAlO₃/SrTiO₃ interface”, M.M. Mehta, D.A. Dikin, C.W. Bark, S. Ryu, C.M. Folkman, C.B. Eom & V. Chandrasekhar, *Nature Communications*, **3**, 955, DOI: 10.1038/ncomms (2012)
11. “Electric modulation of magnetization at the BaTiO₃/La_{0.67}Sr_{0.33}MnO₃ interfaces”, H. Lu, T. A. George, Y. Wang, I. Ketsman, J. D. Burton, C.-W. Bark, S. Ryu, D. J. Kim, J. Wang, C. Binek, P. A. Dowben, A. Sokolov, C.-B. Eom, E.Y. Tsymbal, and A. Gruverman, *Appl. Phys. Lett.*, **100**, 232904 (2012)
12. “Probing Surface and Bulk Electrochemical Processes on the LaAlO₃–SrTiO₃ Interface”, Amit Kumar, Thomas M. Arruda, Yunseok Kim, Ilia N. Ivanov, Stephen Jesse, Chung W. Bark, Nicholas C. Bristowe, Emilio Artacho, Peter B. Littlewood, Chang-Beom Eom, and Sergei V. Kalinin, *ACS Nano*, **6**, 3841 (2012)

13. "Localization of Two-dimensional Electron Gas in LaAlO₃/SrTiO₃ Heterostructures", T. Hernandez, C.W. Bark, D.A. Felker, C. B. Eom, M.S. Rzchowski, *Phys. Rev. B*, **85**, 161407 (2012)
14. "Mechanical Writing of Ferroelectric Polarization", H. Lu, C.-W. Bark, D. Esque de los Ojos, J. Alcalá, C.B. Eom, G. Catalan, and A. Gruverman, *Science*, **336**, 59 (2012)
15. "Switchable induced polarization in LaAlO₃/SrTiO₃ heterostructures", C. W. Bark, P. Sharma, Y. Wang, S.H. Baek, S. Lee, S. Ryu, C. M. Folkman, T. R. Paudel, A. Kumar, S.V. Kalinin, A. Sokolov, E. Y. Tsymbal, M. S. Rzchowski, A. Gruverman, C.B. Eom, *Nano Letters*, **12**, 1765 (2012)
16. "Structure, physical properties, and applications of SrRuO₃ thin films", G. Koster, L. Klein, W. Siemons, G. Rijnders, J.S. Dodge, C.B. Eom, D.H.A. Blank, and M.R. Beasley, *Rev. Mod. Phys.*, **84**, 253 (2012)
17. "Enhancement of Ferroelectric Polarization Stability by Interface Engineering", H. Lu, X. Liu, D. J. Kim, A. Stamm, J. D. Burton, P. Lukashev, C.W. Bark, D.A. Felker, C. M. Folkman, X. Pan, M. S. Rzchowski, C.-B. Eom, E. Y. Tsymbal, and A. Gruverman, *Advanced Materials*, **24**, 1209 (2012)
18. "Direct Observations of Retention Failure in Ferroelectric Memories", P. Gao, C.T. Nelson, J.R. Jokisaari, Y. Zhang, S.H. Baek, C.W. Bark, E. Wang, Y.M. Liu, J.Y. Li, C.B. Eom, X.Q. Pan, *Advanced Materials*, **24**, 1106 (2012)
19. "Nonlinearity in the high-electric-field piezoelectricity of epitaxial BiFeO₃ on SrTiO₃", Pice Chen, Rebecca J. Sichel, Ji Young Jo, Ryan T. Smith, Chang-Beom Eom, Osami Sakata, Eric M. Dufresne, and Paul G. Evans, *Appl. Phys. Lett.*, **100**, 062906 (2012)
20. "Multilevel Data Storage Memory Using Deterministic Polarization Control" D. Lee, S.M. Yang, T.H. Kim, B.C. Jeon, Y.S. Kim, J.G. Yoon, H.N. Lee, S.H. Baek, C.B. Eom, T.W. Noh, *Advanced Materials*, **24**, 402 (2012)
21. "Mechanical Writing of Ferroelectric Polarization", H. Lu, C.-W. Bark, D. Esque de los Ojos, J. Alcalá, C.-B. Eom, G. Catalan, and A. Gruverman, *Science*, **in press** (2012)
22. "Switchable induced polarization in LaAlO₃/SrTiO₃ heterostructures", C. W. Bark, P. Sharma, Y. Wang, S.H. Baek, S. Lee, S. Ryu, C. M. Folkman, T. R. Paudel, A. Kumar, S.V. Kalinin, A. Sokolov, E. Y. Tsymbal, M. S. Rzchowski, A. Gruverman, C.B. Eom, *Nano Letters*, **in press** (2012)
23. "Localization of Two-dimensional Electron Gas in LaAlO₃/SrTiO₃ Heterostructures", T. Hernandez, C.W. Bark, D.A. Felker, C. B. Eom, M.S. Rzchowski, *Phys. Rev. B, Rapid Communications* **in press** (2012)
24. "Structural coupling across the LaAlO₃/SrTiO₃ interface: High-resolution x-ray diffraction study" J.E. Boschker, C.M. Folkman, C.W. Bark, Å.F. Monsen, E. Folven, J.K. Grepstad, E. Wahlström, C.B. Eom, and T. Tybell, *Phys. Rev. B*, **84**, ID. 205418 (2012)
25. "Nonlinearity in the high-electric-field piezoelectricity of epitaxial BiFeO₃ on SrTiO₃", Pice Chen, Rebecca J. Sichel, Ji Young Jo, Ryan T. Smith, Chang-Beom Eom, Osami Sakata, Eric M. Dufresne, and Paul G. Evans, *Appl. Phys. Lett.*, **100**, 062906 (2012)
26. "Enhancement of Ferroelectric Polarization Stability by Interface Engineering", H. Lu, X. Liu, D. J. Kim, A. Stamm, J. D. Burton, P. Lukashev, C.-W. Bark, D.A. Felker, C. M. Folkman, X. Pan, M. S. Rzchowski, C.-B. Eom, E. Y. Tsymbal, and A. Gruverman, *Advanced Materials*, DOI: 10.1002 / adma.201104398 (2012)

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28. "Revealing the role of defects in ferroelectric switching with atomic resolution" P. Gao, C.T. Nelson, J.R. Jokisaari, S.H. Baek, C.W. Bark, Y. Zhang, E.G. Wang, D.G. Schlom, Darrell, C.B. Eom, X.Q. Pan, *Nature Communications*, **2**, 591 (2011)
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31. "Domain Dynamics during Ferroelectric Switching", C.T. Nelson, P. Gao, J. R. Jokisaari, C. Heikes, C. Adamo, A. Melville, S.H. Baek, C.M. Folkman, B. Winchester, Y. Gu, Y. Liu, K. Zhang, E. Wang, J. Li, L.Q. Chen, C. B. Eom, D. G. Schlom, Xiaoqing Pan, *Science*, **334**, 968 (2011)
32. "The behavior of grain boundaries in the Fe-based superconductors", J. H. Durrell, C. B. Eom, A. Gurevich, E. E. Hellstrom, C. Tarantini, A. Yamamoto, D. C. Larbalestier, *Reports on Progress in Physics*, **74**, 124511 (2011)
33. "Structure, physical properties, and applications of SrRuO₃ thin films", G. Koster, L. Klein, W. Siemons, G. Rijnders, J.S. Dodge, C.B. Eom, D.H.A. Blank, and M.R. Beasley, *Rev. Mod. Phys.*, *in press* (2011)
34. "Twin wall distortions through structural investigation of epitaxial BiFeO₃ thin films", Chad M. Folkman, Seung-Hyub Baek and Chang-Beom Eom, *J. Mat. Res.*, **26**, 2844 (2011)
35. "Polarity control of carrier at ferroelectric/metal interfaces for electrically switchable diode and photovoltaic effects", D. Lee, S. H. Baek, T. H. Kim, J.-G. Yoon, C. M. Folkman, C. B. Eom and T. W. Noh, *Physical Review B*, **84**, 125305 (2011)
36. "Structural consequences of ferroelectric nanolithography", Ji Young Jo, Pice Chen, Rebecca J. Sichel, Seung-Hyub Baek, Ryan T. Smith, Nina Balke, Sergei V. Kalinin, Martin V. Holt, Jörg Maseri, Kenneth Evans-Lutterodt, Chang-Beom Eom, and Paul G. Evans, *Nano Letters*, **11**, 3080 (2011)
37. "Thick lead-free ferroelectric films with high Curie temperatures through nanocomposite-induced strain", S. A. Harrington, J. Zhai, S. Denev, V. Gopalan, H. Wang, Z. Bi, S. A. T. Redfern, S. H. Baek, C. W. Bark, C. B. Eom, Q. X. Jia, M.E. Vickers, J. L. MacManus-Driscoll, *Nature Nanotechnology*, **6**, 491 (2011)
38. "Coherent Brillouin spectroscopy in a strongly scattering liquid by picosecond ultrasonics", A. A. Maznev, Kara J. Manke, Christoph Klieber, Keith A. Nelson, Seung Hyub Baek, and Chang-Beom Eom, *Optics Letters*, **36**, 2925 (2011)
39. "Coexistence of superconductivity and ferromagnetism at the interface between LaAlO₃ and SrTiO₃" D.A. Dikin, M. Mehta, C.W. Bark, C.M. Folkman, C.B. Eom and V. Chandrasekhar, *Phys. Rev. Letts.*, **107**, 056802 (2011)

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42. "Dependence of epitaxial Ba(Fe_{1-x}Co_x)₂As₂ thin films properties on SrTiO₃ template thickness", S. Lee, J. Jiang, J. D. Weiss, C. W. Bark, C. Tarantini, M. D. Biegalski, A. Polyanskii, Y. Zhang, C. T. Nelson, X.Q. Pan, E. E. Hellstrom, D. C. Larbalestier, and C. B. Eom, *IEEE Trans on Applied Superconductivity*, **21**, 2882 (2011)
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44. "Tailoring a two-dimensional electron gas at the LaAlO₃/SrTiO₃ (001) interface by epitaxial strain" Rewritable nanoscale oxide photodetector" C. W. Bark, D. A. Felker, Y. Wang, Y. Zhang, H. W. Jang, C. M. Folkman, J. W. Park, S. H. Baek, H. Zhou, D.D. Fong, X. Q. Pan, E. Y. Tsymbal, M. S. Rzchowski, C. B. Eom, *Proc. Natl. Acad. Sci.*, **108**, 4720 (2011)
45. "Superfluid density measurements of Ba(Co_xFe_{1-x})₂As₂ films near optimal doping" Jie Yong, S. Lee, J. Jiang, C. W. Bark, J. D. Weiss, E. E. Hellstrom, D. C. Larbalestier, C. B. Eom, and T. R. Lemberger, *Phys. Rev. B*, **83**, 104510 (2011)
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47. "Spontaneous Vortex Nanodomain Arrays at Ferroelectric Heterointerfaces" Christopher T. Nelson, Benjamin Winchester, Yi Zhang, Sung-Joo Kim, Alexander Melville, Carolina Adamo, Chad M. Folkman, Chang-Beom Eom, Darrell G. Schlom, Long-Qing Chen, and Xiaoqing Pan, *Nano Letters*, **11**, 828 (2011)
48. "Self-Assembled Oxide Nanopillars in Epitaxial Co-doped BaFe₂As₂ Thin Films for Vortex Pinning" Yi Zhang, Christopher T. Nelson, Sanghan Lee, Jianyi Jiang, Chung Wung Bark, Jeremy Weiss, Chiara Tarantini, Chad M. Folkman, Seung-Hyub Baek, Eric E. Hellstrom, David C. Larbalestier, Chang-Beom Eom, Xiaoqing Pan, *Appl. Phys. Letts.*, **98**, 042509 (2011)
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51. "Rewritable nanoscale oxide photodetector" Patrick Irvin, Yanjun Ma, Daniela F. Bogorin, Cheng Cen, Chung Wung Bark, Chad M. Folkman, Chang-Beom Eom and Jeremy Levy, *Nature Photonics*, **4**, 849, (2010)

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56. "Creation of a two-dimensional electron gas at an oxide interface grown on silicon" J.W. Park, D.F. Bogorin, C. Cen, D.A. Felker, C.T. Nelson, Y. Zhang, C.W. Bark, C.M. Folkman, X.Q. Pan, M.S. Rzchowski, J. Levy and C.B. Eom, *Nature Communications*, **1**, 94 (2010)
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61. "Nanoscale rectification at the LaAlO₃/SrTiO₃ interface " Daniela F. Bogorin, Chung Wung Bark, Ho Won Jang, Cheng Cen, C.M. Folkman, Chang-Beom Eom, Jeremy Levy, *Appl. Phys. Lett.* **97**, 013102 (2010)
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65. "Multi-gap superconductivity in a BaFe_{1.84}Co_{0.16}As₂ film from optical measurements at terahertz frequencies" A. Perucchi, L. Baldassarre, C. Marini, S. Lupi, J. Jiang, M. Putti, I.

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 71. "New Fe-based superconductors: properties relevant for applications", M. Putti, I. Pallecchi, E. Bellingeri, M. Tropeano, C. Ferdeghini, A. Palenzona, C. Tarantini, A. Yamamoto, J. Jiang, J. Jaroszynski, F. Kametani, D. Abraimov, A. Polyanskii, J.D. Weiss, E.E. Hellstrom, A. Gurevich, D.C. Larbalestier, R. Jin, B.C. Sales, S.A. Sefat, M.A. McGuire, D. Mandrus, P. Cheng, Y. Jia, H.H. Wen, S. Lee, C.B. Eom, *SUST*, **23**, 034003 (2010)
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