JEFFREY A. EASTMAN

Argonne National Laboratory		Office:	(630) 252-5141
Materials Science Division		FAX:	(630) 252-7777
Building 241, Rm. A-170		Administrative Asst.:	(630) 252-6525
9700 S. Cass Ave.		Electronic Mail:	jeastman@anl.gov
Argonne, IL 60439			

Research Interests

In-situ synchrotron x-ray studies of materials growth, characterization, and properties, defect and transport behavior in oxide and nitride heterostructures, epitaxial thin films, ferroelectric properties of single crystal oxide thin films, nanostructured materials, nanoscale thermal properties in films and nanostructures

Education

Ph.D., Materials Science (1985), Cornell University, Ithaca, NY 14853
M.S., Metallurgical Engineering (1982), University of Illinois, Urbana, IL 61801
B.S., Metallurgical Engineering (1979), University of Illinois, Urbana, IL 61801

Graduate and Postdoctoral Advisors

M.S. Advisor: Prof. H.K. Birnbaum, University of Illinois, Urbana, IL (deceased)
Ph.D. Advisor: Prof. S.L. Sass, Cornell University, Ithaca, NY (emeritus)
Postdoctoral Advisor: Prof. M. Rühle, Max-Planck-Institut für Metallforschung, Stuttgart, Germany (retired)

Professional Experience

2013 - present:	Senior Materials Scientist, Materials Science Division, Argonne National Laboratory
1994 - 2013:	Materials Scientist, Materials Science Division, Argonne National Laboratory
2002 - 2007:	Group Leader, Alloy Oxidation Group, Materials Science Division, Argonne National Laboratory
2003 - 2005:	Interim Group Leader, Interfacial Materials Group, Materials Science Division, Argonne National Laboratory
1987 - 1994:	Assistant Materials Scientist, Materials Science Division, Argonne National Laboratory
1985 - 1987:	Alexander von Humboldt Post-Doctoral Fellow, Max-Planck-Institut für Metallforschung, Institut für Werkstoffwissenschaften, Stuttgart, Germany

Recent Professional Service

2002-2017: Member, Materials Research Society Awards Committee
2014-2017: Chair, Materials Research Society Postdoctoral Awards Committee
2016: Meeting Chair, XXV International Materials Research Congress, Cancun, Mexico.
2015-2016: Member, Director's Review Committee, Argonne Innovate LDRD program.
2010-2013: Chair, Materials Research Society External Awards Committee
2002-2009: Member, Graduate Student Awards Subcommittee (subcommittee chair in 2008 and 2009)
2008-present: Member, Advanced Photon Source Beamtime Allocation Committee

Honors

University of Chicago-Argonne Board of Governors Distinguished Performance Award (2013)
Alexander von Humboldt Post-Doctoral Fellowship (1985-1987)
Tau Beta Pi, National Engineering Honor Society
Alpha Sigma Mu, National Metallurgical Honor Society

Patents

R. W. Siegel, H. Hahn, and J. A. Eastman, "Method of Making Nanocrystalline α-Al_2O_3," U.S. Patent #5,128,081, (issued July 7, 1992).

J. A. Eastman, K. E. Sickafus, and J. E. Katz, "Microwave Sintering of Nanophase Ceramics Without Concomitant Grain Growth," U.S. Patent #5,223,186, (issued June 29, 1993).

J. A. Eastman, M. S. Rittner, C. J. Youngdahl, and J. R. Weertman, "Gas Condensation Process to Produce Nanophase Composites with Controllable Second Phase Concentrations and Controllable Mechanical Properties," U.S. Patent #5,728,195 (issued March 17, 1998).

U.S. Choi and J.A. Eastman, "Enhanced Heat Transfer Using Nanofluids," U.S. Patent #6,221,275 (issued April 24, 2001).

J.A. Eastman and L.J. Thompson, "Nanocrystalline Films for Gas-Reactive Applications," U.S. Patent #6,691,554 (issued February 17, 2004).

J.A. Eastman, B.W. Veal, and P. Zapol, "Interfacial Control of Oxygen Vacancy Doping and Electrical Conduction in Thin Film Oxide Heterostructures," (filed application #62/517,809 June 9, 2017).

Selected Recent Publications (of ~150 total; >12,500 citations; h-index: 44)

G. Xu, M.J. Highland, C. Thompson, J.A. Eastman, P.H. Fuoss, H. Zhou, R. Dejus, G.B. Stephenson, "Characterization of the X-ray coherence properties of an undulator beamline at the Advanced Photon Source," J. Synch. Rad., **25**, Part 4, 1036-1047 (2018).

M.J. Highland, S.O. Hruszkewycz, D.D. Fong, C. Thompson, P.H. Fuos, I. Calvo-Almazan, S. Maddali, A. Ulvestad, E. Nazaretski, X. Huang, H. Yan, Y.S. Chu, H. Zhou, P.M. Baldo, J.A. Eastman, "In-situ Synchrotron X-ray Studies of the Microstructure and Stability of In_2O_3 Epitaxial Films," Appl. Phys. Lett., **111**, no. 16, 161602 (2017), DOI: 10.1063/1.4997773.

B.W. Veal, J.A. Eastman, "Conduction in In_2O_3/YSZ heterostructures: Complex Interplay between Electrons and Ions, Mediated by Interfaces," APL Materials, **5**, no. 4, 042502 (2017), DOI: 10.1063/1.4977205.

B.W. Veal, S.K. Kim, P. Zapol, H. Iddir, P.M. Baldo, J.A. Eastman, "Interfacial control of oxygen vacancy doping and electrical conduction in thin film oxide heterostructures," Nature Communications, **7**, 11892 (2016), DOI: 10.1038/ncomms11892.

M.J. Highland, E. Perret, C.M. Folkman, D.D. Fong, Carol Thompson, P.H. Fuoss, J.A. Eastman, "Effect of SrO doping on $LaGaO_3$ synthesis via magnetron sputtering," Cryst. Growth & Design, **16**, no. 12, 6812-6816 (2016), DOI: 10.1021/acs.cgd.6b00914.

M. J. Highland, D. D. Fong, G. Ju, C. Thompson, P. M. Baldo, P. H. Fuoss, and J. A. Eastman, "In-situ x-ray studies of compositional control during synthesis of $LaGaO_3$ by radio frequency-magnetron sputtering," Appl. Phys. Lett. **107,** 081606 (2015), DOI: http://dx.doi.org/10.1063/1.4929753.

E.M. Hopper, E. Perret, B.J. Ingram, H. You, K.-C. Chang, P.M. Baldo, P.H. Fuoss, J.A. Eastman, "Oxygen Exchange in $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ Thin Film Heterostructures Under Applied Electric Potential," J. Phys. Chem. C., **119**, no. 34, 19915-19921 (2015), DOI: 10.1021/acs.jpcc.5b05505.

B.W. Veal, P.M. Baldo, A.P. Paulikas, J.A. Eastman, "Understanding Artifacts in Impedance Spectroscopy," J. Electrochem. Soc., 162, no. 1, H47-H57 (2015), DOI: 10.1149/2.0791501jes.

M.J. Highland, D.D. Fong, G.B. Stephenson, T.T. Fister, P.H. Fuoss, S.K. Streiffer, C. Thompson, M.I. Richard, J.A. Eastman, "Interfacial charge and strain effects on the ferroelectric behavior of epitaxial (001) $PbTiO_3$ films on (110) $DyScO_3$ substrates," Applied Physics Letters, **104**,132901 (2014), DOI:10.1063/1.4869579.

S.-H. Chang, R. Subbaraman, K.-C. Chang, N. Danilovic, A. P. Paulikas, D. D. Fong, M. J. Highland, P. M. Baldo, V. R. Stamenkovic, J. W. Freeland, J. A. Eastman, and N. M. Markovic, "Functional links between stability and reactivity of strontium ruthenate single crystals during oxygen evolution," Nature Comm. **5,** 4191 (2014), DOI: 10.1038/ncomms5191.

A. Rebola, D.D. Fong, J.A. Eastman, S. Ogut, P. Zapol, "First-principles study of compensation mechanisms in negatively charged $LaGaO_3/MgAl_2O_4$ interfaces," Phys. Rev. B, **87**, no. 24, 245117 (2013).

B.J. Ingram, J.A. Eastman, K.C. Chang, S.K. Kim, T.T. Fister, E. Perret, H. You, P.M. Baldo, P.H. Fuoss, "In situ x-ray studies of oxygen surface exchange behavior in thin film $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$," Appl. Phys. Lett., **101**, no. 5, 051603 (2012).

Programs directed

"Proximity Effects in Charged Oxide Heterostructures," Lead PI, DOE-BES program funded at $1.3M per year, 2007 – 2017.

"Alloy Oxidation," Lead PI, DOE-BES program funded at $1.3M per year, 2002 – 2007.

"Interfacial Materials," Lead PI, DOE-BES program funded at $1.7M per year, 2003-2005.

"Oxide Dispersed Nanofluids for Next Generation Heat Transfer Fluids," Lead laboratory PI, BES-funded STTR program, Stage 2, 2002.

"Oxide Dispersed Nanofluids for Next Generation Heat Transfer Fluids," Lead laboratory PI, BES-funded STTR program, Stage 1, 2001.

"MOCVD-Processed Nanocrystalline Zirconia Thermal Barrier Coatings," Lead PI, funded LDRD, FY1998–2000.

"Applications of nanoparticle technology to the development of a new class of energy-efficient industrial heat transfer fluids," Lead PI, funded LDRD, FY 1995–1997.

"Synthesis and characterization of nanocrystalline barium titanate," Lead PI, funded LDRD, FY 1995–1997.