

G. Brian Stephenson

Argonne National Laboratory
Materials Science Division
Building 242, Rm. F204
9700 S. Cass Ave.
Argonne, IL 60439

Office: (630) 252-3335

Email: stephenson@anl.gov

Research Interests

Real-time x-ray scattering studies of metal-organic vapor phase epitaxy and dynamics of materials processing. Advances in coherent x-ray methods such as x-ray photon correlation spectroscopy and coherent diffraction imaging. Development of novel x-ray techniques for *in situ* studies of materials synthesis.

Education

Ph.D., Materials Science (1983), Stanford University, Stanford, CA

S.M., Materials Science (1978), Massachusetts Institute of Technology, Cambridge, MA

S.B., Materials Science (1978), Massachusetts Institute of Technology, Cambridge, MA

Graduate and Postdoctoral Advisors

Ph.D. Advisor: Prof. A. I. Bienenstock, Stanford University

Postdoctoral Advisor: Prof. J. Margrave, Rice University

Professional Experience

2014-2019	Argonne National Laboratory, Management Team, Materials Science Div.
2012-present	Northwestern University, Adjunct Professor, Materials Science and Eng.
2012-present	Argonne National Laboratory, Argonne Distinguished Fellow
2011-2014	Argonne National Laboratory, Associate Laboratory Director
2011-2014	Argonne National Laboratory, Director, Advanced Photon Source
2010-2011	Argonne National Laboratory, Interim Associate Laboratory Director
2010-2011	Argonne National Laboratory, Interim Director, Advanced Photon Source
2002-2012	Argonne National Laboratory, Senior Physicist
2001-2010	Argonne National Laboratory, Group Leader
1995-2001	Argonne National Laboratory, Physicist
1987-1993	IBM Research Division, Yorktown Heights, Manager
1983-1995	IBM Research Division, Yorktown Heights, Research Staff Member
1982-1983	Rice University, NSF Postdoctoral Fellow

Recent Professional Service

2014-present	Chair, External Advisory Committee, Cornell High Energy Synchrotron Source
2013-2016	Scientific Advisory Committee, Australian Synchrotron
2012-present	Scientific Advisory Committee, National Synchrotron Radiation Research Center, Taiwan
2011-2013	Scientific Advisory Committee, Linac Coherent Light Source, SLAC
2010-2013	Advisory Committee, Energy Recovery Linac, Cornell University
2009-2013	Advisory Committee, Center for Defect Physics in Structural Materials (DOE EFRC), Oak Ridge National Laboratory
2008-2009	Experimental Facilities Advisory Committee, NSLS-II, Brookhaven National Laboratory
2004-2012	Scientific Theme Leader, X-ray Correlation Spectroscopy, Linac Coherent Light Source, SLAC

Honors

R&D 100 Award, Hard X-ray Nanoprobe	2009
Fellow, American Physical Society	1991
NSF Postdoctoral Fellowship	1982-1983
Hertz Foundation Graduate Fellowship	1978-1982
General Motors Scholarship	1976-1978

Selected Recent Publications (of ~180)

- G. Ju, D. Xu, M. J. Highland, C. Thompson, H. Zhou, J. A. Eastman, P. H. Fuoss, P. Zapol, H. Kim, and G. B. Stephenson, "Coherent X-ray Spectroscopy Reveals Persistence of Island Arrangements During Layer-by-Layer Growth," *Nature Physics* **15**, 589–594 (2019).
- G. Ju, M. J. Highland, C. Thompson, J. A. Eastman, H. Zhou, R. Dejus and G. B. Stephenson, "Characterization of the X-ray Coherence Properties of an Undulator Beamline at the Advanced Photon Source," *Journal of Synchrotron Radiation* **25** 1036-1047 (2018).
- W. Roseker, S. O. Hruszkewycz, F. Lehmkuehler, M. Walther, H. Schulte-Schrepping, S. Lee, T. Osaka, L. Strueder, R. Hartmann, M. Sikorski, S. Song, A. Robert, P. H. Fuoss, M. Sutton, G. B. Stephenson and G. Gruebel, "Towards ultrafast dynamics with split-pulse x-ray photon correlation spectroscopy at free electron laser sources," *Nature Communications* **9**, 1704 (2018).
- A. Yau, W. Cha, M. Kanan, G. B. Stephenson, A. Ulvestad, "Bragg Coherent Diffractive Imaging of Single-Grain Defect Dynamics in Polycrystalline Films," *Science* **356**, 739-742 (2017).
- E. Perret, D. Xu, M. J. Highland, G. B. Stephenson, P. Zapol, P. H. Fuoss, A. Munkholm, and C. Thompson, "Island dynamics and anisotropy during vapor phase epitaxy of m-plane GaN," *Applied Physics Letters* **111**, 232102 (2017).
- W. Cha, Y. Liu, H. You, G. B. Stephenson, and A. Ulvestad, "Dealloying in Individual Nanoparticles and Thin Film Grains: A Bragg Coherent Diffractive Imaging Study," *Advanced Functional Materials* **27**, 1700331 (2017).
- G. Ju, M. J. Highland, A. Yanguas-Gil, C. Thompson, J. A. Eastman, H. Zhou, S. M. Brennan, G. B. Stephenson, P. H. Fuoss, "An instrument for in situ coherent x-ray studies of metal-organic vapor phase epitaxy of III-nitrides," *Rev. Sci. Instrum.* **88**, 035113 (2017).
- Y. Liu, P. P. Lopes, W. Cha, R. Harder, J. Maser, E. Maxey, M. J. Highland, N. Markovic, S. O. Hruszkewycz, G. B. Stephenson, H. You, A. Ulvestad, "Stability Limits and Defect Dynamics in Ag Nanoparticles Probed by Bragg Coherent Diffractive Imaging," *Nano Letters* **17**, 1595 (2017).
- A. Ulvestad, M.J. Welland, W. Cha, Y. Liu, J.W. Kim, R. Harder, E. Maxey, J.N. Clark, M.J. Highland, H. You, P. Zapol, S.O. Hruszkewycz and G.B. Stephenson, "Three-dimensional Imaging of Dislocation Dynamics During the Hydriding Phase Transformation," *Nature Materials* **16**, 565 (2017).
- E. Perret, M.J. Highland, G.B. Stephenson, S.K. Streiffner, P. Zapol, P.H. Fuoss, A. Munkholm and C. Thompson, "Real-time x-ray studies of crystal growth modes during metal-organic vapor phase epitaxy of GaN on c- and m-plane single crystals," *Applied Physics Letters* **105**, 051602 (2014).
- M.J. Highland, D.D. Fong, G.B. Stephenson, T.T. Fister, P.H. Fuoss, S.K. Streiffner, C. Thompson, M.I. Richard, J.A. Eastman, "Interfacial charge and strain effects on the ferroelectric behavior of epitaxial (001) PbTiO₃ films on (110) DyScO₃ substrates," *Applied Physics Letters* **104**, 132901 (2014).
- S. O. Hruszkewycz, M. J. Highland, M. V. Holt, D. Kim, C. M. Folkman, C. Thompson, A. Tripathi, G. B. Stephenson, S. Hong, and P. H. Fuoss, "Imaging Local Polarization in Ferroelectric Thin Films by Coherent X-Ray Bragg Projection Ptychography," *Physical Review Letters* **110**, 177601 (2013).