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Materials Science and Technology Division
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Education and Training	Degree	Year	Field
Cornell University, Ithaca NY	Ph.D.	1982	Physics, Materials Science
Cornell University, Ithaca NY	M.S.	1979	Physics
Dartmouth College, Hanover NH	A.B.	1974	Physics, Math

Professional Experience:

2006-present Distinguished R&D Staff, Materials Science & Technology Division, ORNL
2011-2013 Group leader, X-ray and Neutron Scattering and Microscopy
1997-2006 Senior Research Staff, Solid State & Condensed Matter, ORNL
1986-1997 Research Staff Member, Solid State Division, ORNL
1984-1986 Eugene P. Wigner Fellowship, Solid State Division, ORNL
1982-1984 Postdoctoral Technical Staff, AT&T Bell Laboratories, Murray Hill, NJ

Professional Activities, Honors, and Awards:

- UT-Battelle Distinguished Researcher 2015
- Fellow: American Physical Society 2007
- Co-Scientific Director, National School on Neutron & X-ray Scattering, 2009-present
- Approximately 64 invited oral presentations at national and international meetings
- NSLS-II, Proposal Review Panel for Structural Science, 2014 - present
- Mentor, ORNL Materials Science new employee program, 2009 - 2011
- Advanced Light Source Proposal Review Panel for Microdiffraction, (LBNL), 2006- present
- Center for Nanoscale Materials Proposal Evaluation Board (Argonne), 2006- present
- Reviewer for several DOE SBIR, Early Career and University Program, and Army Proposals
- Organizer and Lead, Advanced Photon Source Upgrade Proposal Committee “Submicron & 3D X-ray diffraction,” Selected as A1, Very Strongly Recommended, 2010-2011
- Member, UT-ORNL Advisory Committee for Joint Institute for Advanced Materials (JIAM)
- Invited Lecturer, National School on Neutron and X-ray Scattering, 2010 - present
- Elected Member, Advanced Photon Source Users Steering Committee, 2000 - 2003
- Proposal Review Committee ORNL SEED Money Fund (LDRD) 2000-2002
- R&D 100 Award for textured epitaxial superconductors, 1999
- Department of Energy; Energy100 Award, 2001
- Materials Research Society Trophy Award- Best Manuscript, Fall 2004
- American Museum of Science and Energy Technological Achievement Award, 1999
- Symposia Organizer, American Physical Society, Nanocrystals 1998
- Lockheed Martin NOVA Award, 1997

- Solid State Physics DOE Award - 1996 Significant Implication for DOE Materials Sciences
- Mentor for student research project on superconductivity, Great Lakes Colleges Association Science Semester Program, 1991
- Lockheed Martin Energy Systems Significant Event Award 1996
- Martin Marietta Energy Systems Significant Event Award 1995
- Martin Marietta Energy Systems Technical Achievement Awards: 1990, 1991, 1997
- Martin Marietta Energy Systems Publication Award: Publication 1988
- Symposia Organizer, American Physical Society, Quasicrystals 1988
- Traveling Lecturer, Society of Physics Students Speakers Program, 1988–1995
- Member: American Physical Society (Fellow)
- Member: Materials Research Society
- Member: The Minerals, Metals and Materials Society (TMS)
- Member: Neutron Scattering Society of America
- Member: American Ceramic Society
- Eugene P. Wigner Fellowship, ORNL, 1984-1986
- Salutatorian, Dartmouth College 1974

Patents: 5 US patents licensed to several companies (American Superconductor Corp., 3M, Oxford Superconducting Technology, Midwest Superconductivity Inc, CCVD Microcoating Technologies, EURUS Technologies). Corresponding foreign patents issued in Europe, Japan and Canada

1. J. D. Budai, D. K. Christen, A. Goyal, Q. He, D.M. Kroeger, D.F. Lee, F.A. List, D.P. Norton, M. Paranthaman, B.C. Sales, and E.D. Specht, “High Tc YBCO superconductor deposited on biaxially textured Ni substrate” Oct 19, 1999, U.S. Patent 5,968,877
2. A. Goyal, J.D. Budai, D.M. Kroeger, D.P. Norton, E.D. Specht, and D.K. Christen, “Structures having enhanced biaxial texture”, Sept 28, 1999, U.S. Patent 5,958,599.
3. A. Goyal, J.D. Budai, D.M. Kroeger, D.P. Norton, E.D. Specht, and D.K. Christen, “Structures having enhanced biaxial texture and method of fabricating same”, April 27, 1999, U.S. Patent 5,898,020.
4. A. Goyal, J.D. Budai, D.M. Kroeger, D.P. Norton, E.D. Specht, and D.K. Christen, “Structures having enhanced biaxial texture and method of fabricating same”, April 21, 1998, U.S. Patent 5,741,377
5. A. Goyal, J.D. Budai, D.M. Kroeger, D.P. Norton, E.D. Specht, and D.K. Christen, “Structures having enhanced biaxial texture and method of fabricating same”, April 14, 1998, U.S. Patent 5,739,086

Research Experience and Interests

- Development of new x-ray and neutron scattering techniques exploiting synchrotron and spallation sources for microstructural studies of advanced functional materials
- X-ray and neutron scattering studies, coupled with first-principles calculations, of impact of anharmonic lattice dynamics and vibrational entropy on phase stability and metal-insulator transitions in metal oxides

- Understanding structural mechanisms controlling photoluminescence in a new class of high-efficiency nanoribbon phosphors for wide-spectrum lighting applications.
- Co-development of synchrotron x-ray polychromatic microdiffraction and nondestructive 2D and 3D structural microscopy with submicron spatial resolution.
- Development of new synthesis techniques, including original work demonstrating highly-aligned epitaxial oxide superconducting films on textured metal substrates for high critical-current applications (origin of RABiTS).
- Synthesis and microstructure of semiconductor and magnetic nanocrystals formed by ion implantation, leading to techniques for controlling sizes, phase and orientation.
- Ion-beam synthesis of aligned icosahedral quasicrystals, and x-ray identification and analysis of novel phason defects.

Selected Peer-Reviewed Publications (4/2016): Total ~314 refereed journal papers and conference proceedings, Web of Science Citations > 9700, WoS h-index=49, Google Scholar > 12,800 citations, GoogleScholar h-index 56

J. D. Budai, J. Hong, M. E. Manley, E. D. Specht, C. W. Li, J. Z. Tischler, D. L. Abernathy, A. H. Said, B. M. Leu, L. A. Boatner, R. J. McQueeney, O. Delaire, "Metallization of vanadium dioxide driven by large phonon entropy," *Nature* **515**, 535 (2014).

G. E. Ice, J. D. Budai, and J. W. L. Pang, "The Race To X-Ray Micro/Nanobeam Science," *Science* **334**, 1234 (2011).

J. D. Budai, W. Yang, N. Tamura, J.-S. Chung, J. Z. Tischler, B. C. Larson, G. E. Ice, C. Park and D. P. Norton, "X-ray microdiffraction study of growth modes and crystallographic tilts in oxide films on metal substrates," *Nature Materials* **2**, 487 (2003).

B. C. Larson, W. Yang, G. E. Ice, J. D. Budai, and J. Z. Tischler, "Submicron-Resolution 3D X-Ray Structural Microscopy for Mesoscale Materials Investigations," *Nature* **415**, 887 (2002).

J. D. Budai, C. W. White, S. P. Withrow, M. F. Chisholm, J. Zhu, and R. A. Zuhr, "Controlling the Size, Structure and Orientation of Semiconductor Nanocrystals using Metastable Phase Recrystallization," *Nature* **390**, 384 (1997).

D. P. Norton, A. Goyal, J. D. Budai, D. K. Christen, D. Kroeger, E. Specht, Q. He, B. Saffian, M. Paranthaman, C. Klabunde, D. Lee, B. C. Sales, and F. List, "Epitaxial YBa₂Cu₃O₇ on Biaxially Textured (001) Ni: An Approach to High Critical Current Density Superconducting Tapes," *Science* **274**, 755 (1996).

J. D. Budai, R. T. Young, and B. S. Chao, "In-Plane Epitaxial Alignment of YBa₂Cu₃O_{7-x} Films Grown on Silver Crystals and Buffer Layers," *Appl. Phys. Lett.* **62**, 1836 (1993).

J. D. Budai, J. Z. Tischler, A. Habenschuss, G. E. Ice, and V. Elser, "X-Ray Diffraction Study of Phason Strain Field in Oriented Icosahedral Al-Mn," *Phys. Rev. Lett.* **58**, 2304 (1987).

Recent Collaborators from other Institutions:

L. Assoufid (ANL), M. R. Bayati (NC State Univ, Intel), A. R. Bishop (LANL), A. Bokov (Simon Fraser Univ), C. Callender (Univ Florida), S-W Cheong (Rutgers Univ), Z. R. Dai (LLNL), A. F. Hebard (Univ Florida), E. Karapetrova (ANL), A. Khounsary (ANL), A. Kolmakov (Southern Ill Univ), B. M. Leu (ANL), Xufan Li (Univ Georgia, ORNL), Feng Liu (Univ Georgia), Wenjun Liu (ANL), I. Luk'yanchuk (Univ Picardie, France), R. S. Meltzer

(Univ of Georgia), Jagdish Jay Narayan (NC State Univ), David Norton (Univ Florida), Zhengwei Pan (Univ Georgia), P. Pant (NC State Univ), P.D. Rack (Univ Tenn), B. J. Rodriguez (Univ College Dublin, Ireland), A. Rohatgi (Georgia Inst Tech), A. D. Rollett (Carnegie-Mellon Univ), A. H. Said (ANL), D. D. Sarma (Ind. Inst. of Sci., India), Gopal Shenoy (ANL), E. Strelcov (Southern Ill Univ), J. Z. Tischler (ANL), H. Weiland (Alcoa Inc), Wenge Yang (Carnegie Inst), Z.-G. Ye (Simon Fraser Univ), V. Yelundur (Georgia Inst Tech), Jie Zhang (South. Ill Univ).

Graduate and Postdoctoral Advisors:

Graduate Advisor: Prof. Stephen Sass (Cornell University), research at CHESS synchrotron facility directed by Prof. Bob Batterman

Postdoctoral Advisor: Dr. Ronald Pindak (Bell Labs, Murray Hill NJ, now at Brookhaven National Lab)

Peer-Reviewed Publications

314. G. E. Ice and J. D. Budai, "X-ray microscopy: Beyond ensemble averages," *Nature Materials* **14**, 657 (2015).
313. H. Guo, S. Dong, P. D. Rack, J. D. Budai, C. Beekman, Z. Gai, W. Siemons, C. M. Gonzalez, R. Timilsina, A. T. Wong, A. Herklotz, P. C. Snijders, E. Dagotto, and T. Z. Ward, "Strain Doping: Reversible Single-Axis Control of a Complex Oxide Lattice via Helium Implantation," *Physical Review Letters* **114**, 256801(2015).
312. X. Li, J.D. Budai, F. Liu, J. Y. Howe, J.Z. Tischler, C. Sun, R.S. Meltzer, and Z.W. Pan, "Crystal structures and optical properties of new quaternary strontium europium aluminate luminescent nanoribbons," *Journal of Materials Chemistry C* **3**, 778-788 (2015).
311. E.D. Specht, J. Ma, O. Delaire, J.D. Budai, A.F. May and E.A. Karapetrova, "Nanoscale structure in AgSbTe₂ determined by diffuse elastic neutron scattering," *Journal of Electronic Materials* **44**, 1536-1539 (2015).
310. J. D. Budai, J.W. Hong, M. E. Manley, E. D. Specht, C. W. Li, J. Z. Tischler, D. L. Abernathy, A. H. Said, B. M. Leu, L. A. Boatner, R. J. McQueeney, O. Delaire, "Metallization of vanadium dioxide driven by large phonon entropy," *Nature* **515**, 535 (2014).
309. J. Ma, O. Delaire, E. D. Specht, A.F. May, O. Gourdon, J. D. Budai, M. McGuire, T. Hong, D.L. Abernathy, G. Ehlers, and E. Karapetrova, "Phonon Scattering Rates and Atomic Ordering in Ag_{1-x}Sb_{1+x}Te_{2+x} (x = 0, 0.1, 0.2) Investigated with Inelastic Neutron Scattering and Synchrotron Diffraction," *Physical Review B* **90**, 134303 (2014).
308. M. E. Manley, J. W. Lynn, D. L. Abernathy, E. D. Specht, O. Delaire, A. R. Bishop, R. Sahul, and J. D. Budai, "Phonon localization drives polar nanoregions in a relaxor ferroelectric," *Nature Communications* **5**, Article no. 3683 (2014).
307. F. Liu, R.S. Meltzer, X. Li, J.D. Budai, and Z.W. Pan, "New Localized/Delocalized Emitting State of Eu²⁺ in Orange-Emitting Hexagonal EuAl₂O₄," *Scientific Reports* **4**, srep07101 (2014).
306. J.W.L. Pang, W. Liu, J. D. Budai and G. E. Ice, "Inhomogeneous deformation behavior in intercrystalline regions in polycrystalline Ni," *Acta Materialia* **65**, 393-399 (2014).
305. G. E. Ice, B. C. Larson, J. D. Budai, E. D. Specht, R. I. Barabash, J. W. L. Pang, J. Z. Tischler, and W. Liu. "Emerging capabilities for materials characterization with polychromatic microdiffraction" in *Transactions Symposium: Neutron & Synchrotron Sources: Role in Crystallography*, Vol. **44**, American Crystallographic Association, Buffalo, NY (2014).
304. M.R. Bayati, R. Molaei, F. Wu, J.D. Budai, Y. Liu, R.J. Narayan, J. Narayan, "Correlation between structure and semiconductor-to-metal transition characteristics of VO₂/TiO₂/sapphire thin film heterostructures," *Acta Materialia* **61**, 7805-7815 (2013).
303. M.R. Bayati, Y. Liu, R. Molaei, J.D. Budai, R.J. Narayan, J. Narayan, "Role of of Substrate Crystallographic Characteristics on Structure and Properties of Rutile TiO₂ Epilayers," *Journal of Applied Physics* **114**, 044314 (2013).
302. W. Siemons, C. Beekman, J. D. Fowlkes, N. Balke, J. Z. Tischler, R. Xu, W. Liu, C. M. Gonzales, J. D. Budai, and H. M. Christen, "Focused-ion-beam induced damage in thin films of complex oxide BiFeO₃," *APL Materials* **2**, 022109 (2014).
301. C. Beekman, W. Siemons, T. Z. Ward, J. D. Budai, J. Z. Tischler, R. Xu, W. Liu, N. Balke, J. H. Nam, and H. M. Christen, "Unit cell orientation of tetragonal-like BiFeO₃ thin films grown on highly miscut LaAlO₃ substrates," *Applied Physics Letters* **102**, 221910 (2013).

300. J. C. Lang, S. te Velthuis, B. Chakoumakos, J. Budai, A. Ekkebus, "National School on Neutron and X-ray Scattering," *Synchrotron Radiation News*, Vol. 26, No. 1, 9 (2013).
299. G. E. Ice, J. D. Budai, E. D. Specht, B. C. Larson, J. Pang, R. Barabash, J. Tischler, W. Liu, "The 3D X-Ray Crystal Microscope: An Unprecedented Tool for ICME," Book chapter *2nd World Congress on Integrated Computational Materials Engineering*, eds. M. Li *et al*, John Wiley & Sons, Inc. Hoboken, NJ 183-188 (2013).
298. J. D. Budai, A. Tselev, J. Z. Tischler, E. Strelcov, A. Kolmakov, W. J. Liu, A. Gupta and J. Narayan, "In situ x-ray microdiffraction studies inside individual VO₂ microcrystals," *Acta Materialia* **61**, 2751-2762 (2013).
297. Xufan Li, J. D. Budai, F. Liu, J. Y. Howe, J. Zhang, X. J. Wang, R. S. Meltzer, and Z. W. Pan, "New Yellow (Ba_{0.93}Eu_{0.07})Al₂O₄ Phosphor for Warm-White Light-Emitting Diodes through Single-Emitting-Center-Conversion" *Light: Science and Applications (Nature Group)* **2**, article e50 (2013).
296. F. Liu, J. D. Budai, X. Li, J. Z. Tischler, J. Y. Howe, J. Tao, R. Hui, R. S. Meltzer, and Z.W. Pan, "New Eu²⁺-Activated Europium Aluminate Luminescent Nanoribbons for Nanophotonics and Solid-State Lighting," *Advanced Functional Materials* **23**, 1998-2006 (2013).
295. E. Strelcov, A. Tselev, I. Ivanov, J. D. Budai, J. Zhang, J. Z. Tischler, I. Kravchenko, S. Kalinin and A. Kolmakov, "Doping-Based Stabilization of the M2 Phase in Free-Standing VO₂ Nanostructures at Room Temperature," *Nano Letters* **12**, 6198-6205 (2012).
294. R.I. Barabash, W. Liu, J.Z. Tischler, H. Bei, and J.D. Budai, "Phase-specific elastic/plastic interface interactions in layered NiAl–Cr(Mo) structures," *Acta Materialia* **60**, 3279 (2012).
293. G. E. Ice, J. D. Budai, and J. W. L. Pang, "The Race To X-Ray Micro/Nanobeam Science," *Science* **334**, 1234 (2011).
292. G. E. Jellison, Jr., M. A. McGuire, L. A. Boatner, J. D. Budai, E. D. Specht and D. J. Singh, "The Spectroscopic Dielectric Tensor of Monoclinic Crystals: CdWO₄," *Physical Review B* **84**, 195439 (2011).
291. A. Tselev, J. D. Budai, E. Strelcov, J. Z. Tischler, A. Kolmakov, and S. V. Kalinin, "Electromechanical actuation and current-induced metastable states in suspended single-crystalline VO₂ nanoplatelets," *Nano Letters* **11**, 3065-3073 (2011).
290. A.A. Bokov, B.J. Rodriguez, X. Zhao, J-H Ko, S. Jesse, X. Long, W. Qu, T.H. Kim, J.D. Budai, A.N. Morozovska, S. Kojima, X. Tan, S.V. Kalinin and Z.G. Ye, "Compositional disorder, polar nanoregions and dipole dynamics in Pb(Mg_{1/3}Nb_{2/3})O₃-based relaxor ferroelectrics," *Zeitschrift für Kristallographie* **226**, 99-107 (2011).
289. A. Tselev, I.A. Luk'yanchuk, I.N. Ivanov, J.D. Budai, J. Z. Tischler, E. Strelcov, A. Kolmakov, and S. V. Kalinin, "Lattice-Symmetry-Driven Phase Competition in Vanadium Dioxide," *Oxide Nanoelectronics MRS Proceedings* Vol. **1292**, edited by G. Medeiros-Ribeiro, J. Levy, R. Waser, and H. Hwang, Materials Research Society, Warrendale, PA, 67 (2011).
288. A. Tselev, I.A. Luk'yanchuk, I.N. Ivanov, J.D. Budai, J. Z. Tischler, E. Strelcov, A. Kolmakov, and S. V. Kalinin, "Symmetry Relationship and Strain-Induced Transitions between Insulating M1 and M2 and Metallic R Phases of Vanadium Dioxide," *Nano Letters* **10**, 4409 (2010).
287. A. Tselev, E. Strelcov, I.A. Luk'yanchuk, J.D. Budai, J.Z. Tischler, I.N. Ivanov, K. Jones, R. Proksch, S.V. Kalinin, and A. Kolmakov, Correction to "Interplay between Ferroelastic and Metal-Insulator Phase Transitions in Strained Quasi-2D VO₂ Nanoplatelets," *Nano Letters* **10**, 2734 (2010).

286. A. Tselev, E. Strelcov, I.A. Luk'yanchuk, J.D. Budai, J.Z. Tischler, I.N. Ivanov, K. Jones, R. Proksch, S.V. Kalinin, and A. Kolmakov, "Interplay between Ferroelastic and Metal-Insulator Phase Transitions in Strained Quasi-2D VO₂ Nanoplatelets," *Nano Letters* **10**, 2003-2011 (2010).
285. P. Pant, J.D. Budai and J. Narayan, "Nonpolar ZnO film growth and mechanism for anisotropic in-plane strain relaxation," *Acta Materialia* **58**, 1097-1103 (2010).
284. S. V. Kalinin, B. J. Rodriguez, J. D. Budai, S. Jesse, A. N. Morozovska, A. A. Bokov, and Z.-G. Ye, "Direct evidence of mesoscopic dynamic heterogeneities at the surfaces of ergodic ferroelectric relaxors," *Physical Review B* **81**, 064107 (2010).
283. T.Z. Ward, J.D. Budai, Z. Gai, J.Z. Tischler, Lifeng Yin, and J. Shen, "Elastically-Driven Anisotropic Percolation in Electronic Phase-Separated Manganites," *Nature Physics* **5**, 885-888 (2009).
282. G.E. Ice, J.W.L. Pang, B.C. Larson, J.D. Budai, J.Z. Tischler, J.-Y. Choi, W. Liu, C. Liu, L. Asoufid, D. Shu, and A. Khounsary "At the Limit of Polychromatic Microdiffraction," *Mater. Sci. Eng. A* **524**, 3-9 (2009).
281. P. Pant, J.D. Budai, R. Aggarwal, R.J. Narayan and J. Narayan, "Thin film epitaxy and structure property correlations for non-polar ZnO films," *Acta Materialia* **57**, Issue 15 4426-4431 (2009).
280. P. Pant, J.D. Budai, R. Aggarwal, R.J. Narayan and J. Narayan, "Structural characterization of two-step growth of epitaxial ZnO films on sapphire substrates at low temperatures," *Journal of Physics D: Applied Physics* **42**, 105409 (2009).
279. L.C. Tien, D.P. Norton and J.D. Budai, "Epitaxial growth of transparent tin oxide films on (0 0 0 1) sapphire by pulsed laser deposition," *Materials Research Bulletin* **44**, 6-10 (2009).
278. Z. W. Pan, J. D. Budai, Z. R. Dai, M.P. Paranthaman, S. Dai, and D.H. Lowndes, "Zinc Oxide Microtowers by Vapor Phase Homoepitaxial Regrowth," *Advanced Materials* **21**, 890-896 (2009).
277. S.V. Kalinin, B.J. Rodriguez, S. Jesse, J. Budai, A. Bokov, Z.G. Ye, I.K. Bdikin, D. Kiselev, and A. Kholkin, "Mesoscopic structure and thermal- and bias-induced phase transitions on the surfaces of ergodic relaxors," *Fundamental Physics of Ferroelectrics*, Williamsburg, VA (2009).
276. J. D. Budai, W. Liu, J. Z. Tischler, Z.W. Pan, D.P. Norton, B.C. Larson, W. Yang and G.E. Ice, "Polychromatic X-ray Micro- and Nanodiffraction for Spatially-Resolved Structural Studies," *Thin Solid Films* **516**, 8013-8021 (2008).
275. K.H. Kim, D.P. Norton, D.K. Christen, and J. D. Budai, "Formation of oxidation-resistant Cu-Mg coatings on (001) Cu for oxide superconducting tapes," *Surface & Coatings Technology* **202**, 5136 (2008).
274. M. Ivill, S.J. Pearton, S. Rawal, L. Leu, P. Sadik, R. Das, A.F. Hebard, M. Chisholm, J.D. Budai and D.P. Norton, "Structure and magnetism of cobalt-doped ZnO thin films," *New Journal of Physics* **10**, No 6, 065002 (2008).
273. A. Narayanaswamy, J. McBride, L.A. Swafford, S. Dhar, J. D. Budai, L.C. Feldman and S.J. Rosenthal, "Synthesis and characterization of porous TiO₂ with wormhole-like framework structure," *Journal of Porous Materials* **15**, 21-27 (2008).
272. C. Callender, D.P. Norton, R. Das, A.F. Hebard, and J.D. Budai, "Ferromagnetism in Pseudo-Cubic BaFeO₃ Epitaxial Films," *Applied Physics Letters* **92**, 012514 (2008).
271. J. Narayan, P. Pant, W. Wei, R. J. Narayan, and J. D. Budai, "Nanostructured GaN Nucleation Layer for Light-Emitting Diodes," *Journal of Nanoscience and Nanotechnology* **7**, 2719-2725, (2007).

270. Y.W. Kwon, D.P. Norton and J.D. Budai, "Orientation and growth behavior of CaHfO₃ thin films on non-oxide substrates," *Materials Letters* **61**, 3500 (2007).
269. G.E. Ice, C.R. Hubbard, B.C. Larson, J.W.L. Pang, J.D. Budai, S. Spooner, S.C. Vogel, R.B. Rogge, J.H. Fox and R.L. Donaberger, "High-performance Kirkpatrick-Baez supermirrors for neutron milli- and micro-beams," *Materials Science and Engineering A* **437**, 120 (2006).
268. R.I. Barabash, G.E. Ice, C. Roder, J. Budai, W. Liu, S. Figge, S. Einfeldt, D. Hommel, and R.F. Davis, "Characterization of Growth Defects in Thin GaN Layers with X-ray Microbeam," *Phys Stat Sol B* **244**, 1735 (2007).
267. R. I. Barabash, C. Roder, G. E. Ice, S. Einfeldt, J. D. Budai, O. M. Barabash, S. Figge and D. Hommel, "Spatially resolved distribution of dislocations and crystallographic tilts in GaN layers grown on Si(111) substrates by maskless cantilever epitaxy," *Jour. Applied Physics* **100**, 053103 (2006).
266. Y. W. Heo, K. Ip, S. J. Pearton, D. P. Norton and J. D. Budai, "Growth of ZnO thin films on c-plane Al₂O₃ by molecular beam epitaxy using ozone as an oxygen source," *Appl. Surface Science* **252**, 7442 (2006).
265. G. E. Ice, B. C. Larson, W. Liu, R. I. Barabash, E. D. Specht, J. W. L. Pang, J. D. Budai, J. Z. Tischler, A. Khounsary, C. Liu, A. T. Macrander, and L. Assoufid, "Polychromatic X-ray Micro- and Nano-Beam Science and Instrumentation," AIP Conference Proceedings Volume **879**, *Synchrotron Radiation Instrumentation: Ninth International Conference on Synchrotron Radiation Instrumentation*, Daegu, Korea May 28-June 2, 1299-1304 (2006).
264. R. I. Barabash, C. Roder, G. E. Ice, S. Einfeldt, J. D. Budai, W. Liu, O. M. Barabash, S. Figge, D. Hommel, "Spatially Resolved Characterization of Microstructure, Defects and Tilts in GaN Layers Grown on Si(111) Substrates by Maskless Cantilever Epitaxy," Spring 2006 MRS meeting, Symposium I, "Silicon-Based Microphotonics," MRS Proceedings Volume **934E**, p. 0934-I09-06, edited by M. Brongersma, D.S. Gardner, M. Lipson, J.H. Shin, Materials Research Society, Warrendale, PA, (2006).
263. C. W. White, S. P. Withrow, J. D. Budai, D. K. Thomas, J. M. Williams, A. Meldrum, K. D. Sorge, J. R. Thompson, G. W. Ownby, J. F. Wendelken, and L. A. Boatner, "Annealing-environment effects on the properties of CoPt nanoparticles formed in single-crystal Al₂O₃ by ion implantation," *Jour. of Applied Physics* **98**, 114311 (2005).
262. V. Varadarajan, D.P. Norton and J.D. Budai, "Phase stability and orientation of SrCu₂O₂ films grown by pulsed laser deposition," *Thin Solid Films* **488**, 173-177 (2005).
261. C. Cantoni, A. Goyal, U. Schoop, X. Li, M. Rupich, C. Thieme, A. Gapud, T. Kodenkandath, T. Aytug, M. Paranthaman, K. Kim, J.D. Budai, D. Christen, "Investigation of TiN Seed Layers for RABiTS Architectures With a Single-Crystal-Like Out-of-Plane Texture," *IEEE Trans Applied Superconductivity* **15**, 2981 (2005).
260. G. E. Ice, C. R. Hubbard, B. C. Larson, J.W.L. Pang, J. D. Budai, and S. Spooner, "Kirkpatrick-Baez microfocusing optics for thermal neutrons," *Nuclear Inst. & Methods A* **539**, 312 (2005).
259. B.-S. Jeong, Y.W. Heo, D. P. Norton, A.F. Hebard, J.D. Budai, and Y.D. Park, "Properties of anatase Co_xTi_{1-x}O₂ thin films epitaxially grown by reactive sputtering," *Thin Solid Films* **488**, 194 (2005).
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9. J. D. Budai and M. J. Aziz, "Formation of Icosahedral Al-Mn by Ion Implantation into Oriented Crystalline Films," *Physical Review B* **33**, 2876 (1986).
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5. J. D. Budai, and S. L. Sass, "Diffraction Studies of the Atomic Structure of Grain Boundaries," *Journal de Physique (Paris)* **43**, C6-103 (1982).
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Invited Presentations

65. "X-ray and Neutron Scattering Studies of Lattice Dynamics Near the Metal-Insulator Transition in VO₂," 9th International Conference on Inelastic X-ray Scattering, National Synchrotron Radiation Research Center (NSRRC), Hsinchu, Taiwan, Nov. 22-26, 2015.
64. "Microstructure, Anharmonic Phonons and Thermodynamics near the Metal-Insulator Transition in VO₂," Workshop on Competing Interactions and Colossal Responses in Transition Metal Oxides; Telluride Science Research Center Meetings, Telluride, CO, June 8-12, 2015.
63. "Local microstructure in functional oxide films and microcrystals using spatially resolved synchrotron microdiffraction," Symposium: Advances in Thin Films for Electronics and Photonics; TMS 2015 Annual Meeting & Exhibition, Orlando, FL, March 15-19, 2015.
62. "Comprehensive Scattering Studies of Microstructure, Anharmonic Phonons and Thermodynamics near the Metal-Insulator Transition in VO₂," Workshop on high-energy resolution Inelastic X-ray Scattering, Advanced Photon Source Users Meeting, Argonne, IL, May 11-14, 2015.
61. "Proposal Writing: Hints for maximizing your chances for getting beam time," 17th National School on Neutron and X-Ray Scattering, Oak Ridge, TN, June 13-27, 2015.
60. "Microstructure in Individual Grains Measured by 3D X-Ray and Neutron Polychromatic Microdiffraction," International Conference on Processing & Manufacturing of Advanced Materials (THERMEC'2013), Las Vegas, NV, Dec 2-6, 2013.
59. "Synchrotron Scattering Studies of the Metal-insulator Phase Transition and Local Domain Formation in VO₂," TMS Annual Meeting, San Diego, February 16-20, 2014.
58. "Impact of Dynamic Lattice Instabilities and Microstructure on Functional Materials," DOE-Basic Energy Sciences Neutron Scattering Principal Investigators' Meeting, Gaithersburg, MD, July 28-30 2014.
57. "Writing Proposals for Neutron & X-ray Beamtime," 16th National School on Neutron and X-Ray Scattering, Oak Ridge, TN, (highest student rating of 31 lectures by x-ray and neutron experts), June 14-28, 2014.
56. "Understanding Local Phase Evolution using New, High-Resolution X-Ray Microbeam Techniques," 8th Pacific Rim International Conference on Advanced Materials and Processing (PRICM8), Waikoloa, HI, August 2013.
55. "Understanding materials synthesis and properties using Laue diffraction microscopy," Workshop on Materials Synthesis by Design, Argonne National Lab, Argonne, IL, May 2013.
54. "Spatially-resolved X-ray microdiffraction studies inside individual grains and domains," TMS 142nd Annual Meeting (TMS 2013), San Antonio, TX, March 3-7, 2013.
53. "Proposal Writing: Hints for maximizing your chances for getting beam time," 15th National School on Neutron and X-ray Scattering, Oak Ridge TN, August 2013.
52. "In-situ X-ray Laue microdiffraction studies of phase transitions in vanadium dioxide microcrystals," Symposium: Advanced Materials Exploration with Neutrons and Synchrotron X-Rays, Materials Research Society Fall Meeting (MRS 2012), Boston, MA, November 25-30, 2012.
51. "Impact of Microstructure and Dynamic Instabilities on Materials Properties," DOE-Basic Energy Sciences X-Ray Scattering Principal Investigators' Meeting, Gaithersburg, MD, November 2012.
50. "Laue X-Ray Micro/Nano-Diffraction - Studies Inside Individual Nanostructures," Symposia on Neutron and X-Ray Studies of Advanced Materials, TMS 2012 Annual meeting, March 11-15, 2012, Orlando, FL.

49. "Writing Proposals: Hints for maximizing your chances for getting beam time," 14th Neutron and X-ray Scattering School, Oak Ridge TN, August 24, 2012.
48. "Spatially-Resolved Microdiffraction Studies of Local Grains, Strains and Phase Transitions," MS&T'11, Materials Science & Technology 2011, Columbus, OH, October 16-20, 2011.
47. "Synchrotron X-Ray Laue Microbeam Studies of Individual Nanostructures," MS&T'11, Materials Science & Technology 2011, Columbus, OH, Acta Materialia Gold Medal Symposium, October 16-20, 2011.
46. "Understanding Domain Formation, Interactions and Dynamics," BES X-ray Scattering Contractors Meeting, Warrenton, VA, November 14-17, 2010.
45. "Submicron and 3D X-ray Diffraction – Science Case for APS Upgrade Beamline Proposal," Presentation to APS SAC Review Panel, Argonne, IL, March 7, 2011.
44. "Microstructure in Individual Grains Measured by 3D X-Ray and Neutron Polychromatic Microdiffraction," Symposia on Neutron Scattering & X-Ray Studies of Advanced Materials, THERMEC '2011, Quebec City, Canada, August 1-5, 2011.
43. "Using Synchrotron X-ray Microdiffraction to Map Microstructures and Strain," ASM Educational Symposium on Advanced Characterization Methods, American Museum of Science and Energy, Oak Ridge, TN, April 20-21, 2010.
42. "3-D Materials Science Using Polychromatic Synchrotron X-Ray Microdiffraction," Symposia on Three-Dimensional Materials Science, TMS 2010 Annual Meeting, Seattle, WA, February 14-18, 2010.
41. "Materials Studies Using High-Resolution Laue X-Ray Microdiffraction," Symposia on Neutron and X-Ray Studies of Advanced Materials, TMS 2010 Annual Meeting, Seattle, WA, February 14-18, 2010.
40. "Proposal Writing: Hints for maximizing your chances for getting beam time," 12th National School on Neutron and X-ray Scattering, Oak Ridge TN, June 25, 2010.
39. "Submicron-Resolution Characterization of Local Microstructure Using Polychromatic X-Ray Microdiffraction," Materials Science and Technology 2009 (MS&T'09) Conference, Pittsburgh, PA, October 25-29, 2009.
38. "X-Ray Microdiffraction Studies of 3D Microstructure Near Domain Boundaries," presented at the Materials Science and Technology 2009 (MS&T'09) Conference, Pittsburgh, PA, October 25-29, 2009.
37. "Polychromatic X-ray Microdiffraction for Spatially-Resolved Structural Studies of Almost Anything," Advanced Photon Source Lunchtime Seminar Series, Argonne National Laboratory, Argonne, IL, November 7, 2008.
36. "Applications of Polychromatic X-ray Microdiffraction for Studies of Local Structures," Materials Science & Technology (MS&T) 2008 Conference and Exhibition, Pittsburgh, PA. In session: X-Ray and Neutron Diffraction: Developments and Applications, Oct 5-9, 2008.
35. "X-ray Microdiffraction Techniques for Measuring Local Microstructure and Strain Distributions," The 8th International Conference on Residual Stresses, Denver, CO, August 4-8, 2008.
34. "Submicron-resolution mapping of domains, texture and strain using x-ray microdiffraction," The 15th International Conference on the Textures of Materials (ICOTOM 15), Carnegie-Mellon University, Pittsburgh, PA, June 2008.

33. "Polychromatic x-ray microdiffraction studies of local microstructures and strains," Argonne National Laboratory User's Week, Argonne, IL. In Workshop: Diffraction Studies of Structural and Mechanical Properties, May 4-8, 2008.
32. "Studying Complex Materials Using Submicron-Resolution Laue X-ray Microdiffraction," 2008 TMS Annual Meeting & Exhibition, New Orleans, LA, March 2008.
31. "Polychromatic X-ray micro- and nanodiffraction for spatially-resolved structural studies," European Materials Research Society (E-MRS) 2007 Fall Meeting, Warsaw University of Technology, Warsaw, Poland, September 17-21, 2007.
30. "Development and Applications of 3D X-Ray Structural Microscopy with Submicron Spatial Resolution," American Vacuum Society, Florida Chapter, Orlando, Florida, March 11-16, 2007.
29. "Understanding Materials using Focused X-Ray Scattering," Physics Department 342/555, University of Tennessee, Knoxville, TN, February 2007.
28. "How polychromatic microbeams can provide new tools for spatially-resolved materials studies," Workshop on Catalysis Research at the Advanced Photon Source, Argonne, IL; September 2005.
27. "Three-Dimensional Microstructology Studies using Polychromatic X-ray Microdiffraction," Third International Conference on Microstructology, Birmingham, AL, May, 2005.
26. "Polychromatic x-ray microdiffraction studies of the evolution of grain microstructures in 2D and 3D materials," 2003 Fall Meeting of The Minerals, Metals & Materials Society (TMS), Chicago, IL, November, 2003.
25. "Looking Inside Real Materials using 3-D Submicron Laue X-ray Diffraction," Advanced Photon Source User Science Seminar, Argonne, IL, December, 2002.
24. "Materials Science Using Submicron X-ray Diffraction in 2-D and 3-D," Materials Science Department, University of Florida, Gainesville, November, 2002.
23. "Submicron-Resolution Measurement of Texture and Strain in Oxide Films Using X-Ray Microdiffraction," American Ceramic Society 103rd Annual Meeting, Indianapolis, IN, April, 2001.
22. "Submicron-Resolution Texture and Strain Determination Using X-Ray Microbeams," Workshop on Texture in Electronic Applications, NIST, Gaithersburg, MD, October, 2000.
21. "Materials Science Using Submicron-Resolution, Polychromatic X-Ray Diffraction," Tenth User's Meeting for the Advanced Photon Source, Argonne, IL, May, 2000.
20. "Crystals at the End of the X-Ray Rainbow," Advanced Photon Source Lunchtime Seminar Series, Argonne, IL, October, 1999.
19. "Grain-by-Grain Microbeam Studies of Epitaxial Growth of Oxide Films on Vicinal Substrates," National Synchrotron Light Source (NSLS) Users' Meeting, Brookhaven National Laboratory, Upton, New York, May 24-26, 1999.
18. "Ion Beam Synthesis of Semiconductor Nanocrystals," Eleventh International Conference on Surface Modification of Metals by Ion Beams, Beijing, China, September 19-24, 1999.
17. "The Use of X-Ray Microbeams in Materials Science," Ninth User's Meeting for the Advanced Photon Source, Argonne, Illinois, October 15, 1998.
16. "Synthesis, Microstructure, and Properties of Semiconductor Nanocrystals Formed by Ion-Implantation," Invited Seminar at Purdue University, Lafayette, Indiana, November 11, 1997
15. "Synthesis, Microstructure, and Optical Properties of Semiconductor Nanocrystals Formed by Ion-Implantation," Materials Research Society Fall Meeting, Boston MA, November, 1996.

14. "Synthesis and Structure of Ion Implanted Nanocrystals," Plenary talk at the Fifth Annual Workshop of the Consortium for Nanostructured Materials, Vanderbilt University, Nashville, TN, October, 1996.
13. "Nanocrystals Synthesized Using Ion-Implantation at the ORNL Surface Modification and Characterization Facility," DOE Mexico - USA Workshop on Scientific Facilities for Materials Science, Argonne, IL, March 1996.
12. "Formation and Properties of Ion-Implanted Nanocrystals in Insulators," DOE Workshop on Nanoscale Materials for Energy Applications, Berkeley CA, February 1995.
11. "Structural Studies of YBaCuO Thin Films on (001) SrTiO₃ and KTaO₃," Invited Colloquium, Michigan Technological University, Houghton, MI, May, 1989.
10. "X-Ray Characterization of Epitaxial YBCO Thin Films on (001) SrTiO₃ and KTaO₃ Substrates," Ninth Annual TVC-AVS Symposium, Oak Ridge, TN, May 1989.
9. "X-Ray Diffraction Study of Phason Defects in Al-Mn Quasicrystals," Invited Colloquium, Harvard University, Cambridge, MA, October, 1987.
8. "Defects in Quasicrystals," Workshop on X-Ray Synchrotrons and the Development of New Materials, Argonne, ILL, February, 1988.
7. "Structural Studies of Oriented Icosahedral AlMn," March Meeting of the American Physical Society, New York, NY, March, 1987.
6. "X-Ray Measurements of Phason Distortion in Ion-Implanted Al-Mn," International Workshop on Quasicrystals, Beijing, China, September, 1987.
5. "Formation and Characterization of Quasicrystals," Nippon-Sino Symposium on Growth of Crystals and Their Characterization by Synchrotron Radiation, Tsukuba, Japan, September, 1987.
4. "Studies of Icosahedral Al-Mn Formed with Ion Beams and Pulsed Lasers," Materials Science Seminar, Harvard University, Cambridge, MA, February 20, 1986.
3. "X-Ray Diffraction Studies of Oriented Quasicrystals," Japan Atomic Energy Research Institute (JAERI), Tokai, Japan, August 26, 1987.
2. "Diffraction Studies of the Atomic Structure of Grain Boundaries," International Conference on the Structure and Properties of Intergranular Boundaries, Caen, France, September, 1982.
1. "X-Ray Diffraction Studies of the Structure of Grain Boundaries," Materials Research Society Fall Meeting, Boston MA, November, 1981.