

Brent Fultz

Barbara and Stanley Rawn, Jr., Professor of Materials Science and Applied Physics
California Institute of Technology

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Education:

High school graduation, valedictorian, 1972

B.Sc. Physics, Massachusetts Institute of Technology, 1975

M.Sc. Engineering Science, University of California, Berkeley, 1978
Thesis: A Mössbauer Spectrometry Study of Austenite Stability and
Impact Fracture in Fe-6Ni Steel

Ph.D. Engineering Science, University of California, Berkeley, 1982
Thesis: A Mössbauer Spectrometry Study of Fe-Ni-X Alloys
Solute-induced perturbations of the ^{57}Fe hyperfine magnetic field in Fe-Ni and Fe-Ni-X were systematized and explained with a magnetic response model. These systematics were then used to measure solute partitioning to retained austenite in Fe-Ni-X alloys and commercial 9Ni steel.

Employment:

- 6/74-9/74 Engineering Aide, General Electric Co., Nuclear Energy
6/75-9/75 Division, Gas Technology Development, Pleasanton, Calif.
- 2/76-9/82 Graduate Student Research Assistant, Lawrence Berkeley
Laboratory, and Univ. of Calif., Berkeley, Calif.
Continuous employment except:
- 9/78-12/78 Teaching Assistant, Univ. of Calif., Berkeley
- 9/79-12/79
- 9/82-12/82 Postdoctoral Fellow, Materials and Molecular Research Division,
Lawrence Berkeley Laboratory
- 12/82-10/85 Staff Scientist II, Materials and Molecular Research Division,
Lawrence Berkeley Laboratory
- 10/85-12/90 Assistant Professor of Materials Science,
California Institute of Technology
- 1/91-3/97 Associate Professor of Materials Science,
California Institute of Technology
- 5/92-9/92 Contract Professor, Faculty of Engineering,
Università degli Studi di Udine, Italy
- 3/97-1/03 Professor of Materials Science,
California Institute of Technology
- 2/03-7/13 Professor of Materials Science and Applied Physics,
California Institute of Technology
- 7/13- Barbara and Stanley Rawn, Jr. Professor of Materials Science and
Applied Physics, California Institute of Technology

Consulting:

- 2/86 - 4/97 Materials Science and Engineering Consultant
Everett Charles Technologies
700 E. Harrison Avenue
Pomona, Calif. 91767
- 1/94 - 12/95 Defense Science Study Group
Institute for Defense Analyses
1801 N. Beauregard St.
Alexandria, VA 22311-1772
- 3/96 - 10/96 Defense Science Board
Task Force on Tactics and Technology for 21st Century Military
Superiority, sponsored by the Chairman of the Joint Chiefs of Staff
and the Under Secretary of Defense (Acquisition and Technology).
T. Gold and D. Latham, co-chairs.

- 6/97 - Los Alamos National Laboratory
Inelastic neutron scattering studies of lanthanide and actinide metals
- 7/97 - Los Alamos Neutron Science Center (LANSCE) Materials
Program Advisory Committee (beamtime proposal evaluations for
inelastic scattering experiments)
- 11/97 - 1/08 Intense Pulsed Neutron Source (IPNS)
Program Advisory Committee (beamtime proposal evaluations for
inelastic scattering experiments)
- 10/99 External Reviewer, DOE Chemical Sciences Review of
Electrochemical Energy Storage and Conversion Programs,
Argonne National Laboratory, Argonne, IL.
- 10/00 Workshop on Advanced Technologies and Urban Operations,
Institute for Defense Analyses, Nov. 2000
- 11/00 - 7/01 Actium Materials, Inc. Houston, TX,
Scientific Advisory Board Member
- 9/01 Reviewer of Materials Science and Engineering Program, Sandia
National Labs., Livermore California (DOE Office of Science).
- 11/01 Instruments Subcommittee, DOE Office of Science Review of the
Spallation Neutron Source, Oak Ridge, TN (D. Lehman, Chair).
- 10/15-10/24/02 Reviewer of Neutron Sources (IPNS at Argonne, and Lujan
Center at Los Alamos). DOE Office of Science Peer Review.
- 6/2/03-6/4/03 Reviewer of Materials Science Division, Argonne National
Laboratory. DOE Office of Science Peer Review.
- 12/03-1/04 Member of Planck Sorption Cooler Lifetime Tiger Team,
Jet Propulsion Laboratory.
- 1/28/04 Workshop participant: The Future of Inelastic Scattering at IPNS,
Argonne National Lab.
- 12/04 Chair of Advisory Committee Review of the High Flux Isotope
Reactor/Center for Neutron Scattering, Oak Ridge, TN.
- 12/31-2/1/05 Reviewer of diffraction and high-pressure beamlines at the
National Synchrotron Light Source (NSLS) for the Scientific
Advisory Committee of the NSLS.
- 3/24/05 Reviewer of Materials Science and Engineering Program, Sandia
National Labs., Livermore California (DOE Office of Science).
- 2/06 Member of review committee for Lehman Review of ESnet at
Lawrence Berkeley National Lab. (DOE Office of Science).
- 5/06 Reviewer of High Flux Isotope Reactor/Center for Neutron
Scattering, Oak Ridge, TN. DOE Office of Science Peer Review.

- 4/07 Basic Energy Sciences Advisory Committee (BESAC) Committee of Visitors to review the management processes for light sources and accelerators, for the Scientific User Facilities Division of Basic Energy Sciences, DOE.
- 12/07 Reviewer of Advanced Photon Source, Argonne Illinois. DOE Office of Science Peer Review.
- 1/08- Chair of the User Advisory Committee of sector 3-ID at the Advanced Photon Source
- 2008-15 ARCS Instrument Development Team (Chair)
- 2009- College of Reviewers for Canada Research Chairs
- 2/10- Member of the Spectroscopy Technical Advisory Committee for the Advanced Photon Source Upgrade Project
- 4/10 Basic Energy Sciences Advisory Committee (BESAC) Committee of Visitors to review the management processes for light sources and accelerators, for the Scientific User Facilities Division of Basic Energy Sciences, DOE.
- 8/10 Member of Review Committee for the Univ. Chicago Argonne, LLC Board of Governors Review of the Photon Sciences Division and the Advanced Photon Source (APS) Upgrade at Argonne National Laboratory.
- 9/10 Member of Review Committee for the Univ. Chicago Argonne, LLC Board of Governors Review of the Computation, Environment, and Life Sciences Division of Argonne National Lab.
- 3/11 Spokesperson and editor of Scientific Case for Nuclear Resonant Scattering in the Upgrade of the Advanced Photon Source, presentation on 3/7/11 at Argonne, IL.
- 5/11- Contour Energy Systems, Azusa California. Member of Scientific Advisory Board.
- 4/11-4/13 Member of ORNL Neutron Scattering Science Review Committee for general user proposals for beam time at HFIR and SNS. (Two meetings per year at ORNL.)
- 7/11 Member of Review Committee for the Univ. Chicago Argonne, LLC Board of Governors Review of the Photon Sciences Directorate and the Advanced Photon Source at Argonne National Laboratory.
- 7/12 Member of Review Committee for the Univ. Chicago Argonne, LLC Board of Governors Review of the Photon Sciences Directorate and the Advanced Photon Source at Argonne National Laboratory.

- 1/13 Participant “Big Data Roundtable” Simons Foundation, New York.
- 3/13 Chairman of the NSF review of the Center for High Resolution Neutron Scattering (CHRNS) at the NIST Center for Neutron Research, Gaithersburg, MD. April 18-19, 2013.
- 8/13 Reviewer and science adviser for the “Materials Project” first year review. Lawrence Berkeley National Lab. Aug. 2, 2013.
- 8/14 Reviewer and science adviser for the “Materials Project” second year review. Lawrence Berkeley National Lab. Aug. 5, 2014.
- 8/15 Reviewer (Chair) and science adviser for the “Materials Project” third year review. Lawrence Berkeley National Lab. Aug. 4, 2015.
- 1/16-2/16 Reviewer for DOE Office of Science Graduate Student Research Program: SCGSR Peer Review Jan. 26 - Feb. 17, 2016.
- 3/16 Reviewer for Materials Physics & Engineering Beamline at the Advanced Photon Source, Argonne Nat'l Lab. Mar. 7-8, 2016
- 11/16 Reviewer for Inelastic X-ray and Nuclear Resonant Scattering Group (IXM) at the Advanced Photon Source, Argonne Nat'l Lab. Nov. 7-8, 2016.
- 1/17-1/19 U.S. Member of International Advisory Committee for the International Conference on Hyperfine Interactions and their Applications.
- 8/17 External Examiner, Ph.D. thesis defence of Jan-Hendrik Pöhls, Dept. Physics and Atmospheric Science, Dalhousie University, Halifax, Canada. Aug. 3, 2017.
- 11/17 Reviewer for inelastic neutron scattering instrument groups at the Spallation Neutron Source, Oak Ridge, TN.
- 11/18- Member of ORNL Neutron Scattering Science Review Committee for general user proposals for beam time at HFIR and SNS. (Two rounds of proposals per year.)
- 7/19 Reviewer of scientific software group in the Neutron Science Division at ORNL
- 11/20 Reviewer of SNS & HFIR Data Analysis Plan, chaired by Nicholas Schwarz
- 9/21 Reviewer for Initiative Review Committee (IRC) for the Neutron Data Interpretation Platform Ecosystem initiative at Oak Ridge National Laboratory (ORNL) (2021-2024).
- 11/21 User participant in the review of inelastic beamlines 3 and 30 at the Advanced Photon Source, Argonne Nat'l Lab. Nov. 1-2, 2021.
- 4/22 Reviewer for Neutron Data Interpretation Platform Ecosystem Initiative at the SNS Mid-Year Review on April 20, 2022.

Security Clearance:

1994 - 2006 DoD Secret

1999 - 2004 DOE Q

Administrative Committees:

Academic Affairs Committee, Department of Materials Science and Mineral Engineering, University of California, Berkeley, Student Representative, 1977-78

Safety and Laboratory Standards Committee, Materials and Molecular Research Division, Lawrence Berkeley Laboratory, 1977-85

Materials Science Faculty Search Committee, California Institute of Technology, 1987-88

Graduate Studies Committee, California Institute of Technology, 1988-
Chairman: 2008-2011

Option Representative for Materials Science, California Institute of Technology, 1988-2012

Materials Science Faculty Search Committee, California Institute of Technology, 1991-94

Option Representative for Engineering and Applied Science (undergraduate program), California Institute of Technology, 1998-2000

Academic Policies Committee, California Institute of Technology, 1999-2003. *Acting Chair* 2002-3.

Academic Officer, Department of Applied Physics and Materials Science, 2010-2012.

Computer Advisory Committee, California Institute of Technology, *Chairman* 2010-2017

High Performance Computing Committee, California Institute of Technology, Member 2010-2011

Committee on Academics, Engineering and Applied Science Division, California Institute of Technology, Member 2010-

Faculty Board, California Institute of Technology, *Elected Member* 7/1/11-6/30/14.

Option Representative for Materials Science, California Institute of Technology, 2014-2019

Search Committee for Graduate Dean, California Institute of Technology, *Chair*, 1/1/15-1/6/15

Chair, Graduate Study Committee, California Institute of Technology, 2016-2019

Freshman adviser, California Institute of Technology, 2018-2019, 2019-2020, 2020-2021

Library Committee, California Institute of Technology, elected member, 2020 - 2023.

Radiation Safety Committee, California Institute of Technology, appointed member, 2020 - 2023.

Faculty Board, California Institute of Technology,
Elected Member 7/1/21-6/30/24.

Professional Societies and Service:

Membership: The Minerals, Metals, and Materials Society (TMS)
American Physical Society (APS)
Materials Research Society (MRS)

Committees: Metals Properties Council (sponsored by ASM, AWS, ASME, ASTM)
Task Group on Properties of Materials at Cryogenic Temperatures
1982-1984

Chemistry and Physics of Materials Committee
The Minerals, Metals, and Materials Society (TMS) 1987-
Vice-Chairman, 1995 - 96
Chairman, 1997 - 1998

Publications Coordinating Committee
The Minerals, Metals, and Materials Society 1993 - 1996

Divisional Council of the Electronic, Magnetic, and Photonic
Materials Division (EMPMD) of the
The Minerals, Metals, and Materials Society 1994 - 1998

Atomic Transport Committee, ASM International, 1989-
Vice-Chairman, 1992-94
Chairman, 1994 - 97

Divisional Council of the Materials Science Division (MSD) of the
American Society for Metals 1994 - 97

Synchrotron Radiation Instrumentation Collaborative Access Team
Advanced Photon Source, Mössbauer beamline, Argonne, Illinois
1994 – 2002

Los Alamos Neutron Science Center (LANSCE) Users' Group (LUG)
Executive Committee, Neutron Scattering Representative, 2001-2002

U.S. Representative (one of two) on the International Board for the
Applications of the Mössbauer Effect 1999 – 2005

Neutron Scattering Society of America
Member of Executive Committee 2006-2009

Neutron Scattering Society of America
Member of Awards Committee 2009-2012

Guest Editor (with X.-L. Wang and H. Choo) of Applied Physics A
Volume 99 No. 3, June, 2010 "Emerging Applications of Neutron
Scattering in Materials Science and Engineering".

Awards and Honors:

Associate Member, Society of Sigma Xi, 1975

Travel Fellowship for the 5th University Glass Conference, Rensselaer
Polytechnic Institute, Aug., 1979

Scholastic Achievement Award, Golden Gate Chapter of the American
Society for Metals, 1979

John E. Dorn Achievement Award, Golden Gate Chapter of the American
Society for Metals, 1981

IBM Faculty Development Award, 1986, 1987

Xerox Foundation Grant, 1986

Jacob Wallenberg Foundation Scholarship, 1988

Presidential Young Investigator Award, 1988-93

TMS Student Paper Award (supervised Lawrence Anthony,
awardee in both 1988 and 1989)

Distinguished Scientist/Engineer Award of TMS EMPMD, 2010

William Hume-Rothery Award of TMS, 2016

"In recognition of his groundbreaking contributions to the thermodynamics
of materials"

Fellow of the Neutron Scattering Society of America, 2016

"For outstanding record of leadership and service to the neutron scattering
community, and important discoveries in the field of vibrational entropy
and alloy thermodynamics."

Society of Sigma Xi, The Scientific Research Honor Society, Full
Member, 2017

Fellow of the American Physical Society, elected 2017

"For seminal experiments demonstrating the importance of vibrational
entropy to the phase stability of materials and transformational leadership
in the development of measurement techniques."

TMS Fellow Award, Class of 2018

"For leadership in establishing the importance of vibrational entropy to the

phase stability of alloys and for the transformational advances in measurement technique."

2019 Outstanding Referee of Physical Review journals (chosen by the journal editors)

Patents:

B. Fultz, "Radiation Detector", U.S. Patent No. 4,393,306. July 12, 1983. Patent rights licensed to Ranger Scientific, Inc.

Ratnakumar V. Bugga, Gerald Halpert, Brent Fultz, Charles Witham, Robert C. Bowman, Jr. and Adrian Hightower
"Metal Hydrides as Electrode/Catalyst Materials for Oxygen Evolution/Reduction in Electrochemical Devices",
U.S. Patent No. 5,656,388 issued Aug. 12, 1997.

Ratnakumar V. Bugga, Brent Fultz, Robert C. Bowman, Jr., Subbarao Surampudi, Charles Witham, and Adrian Hightower,
"LaNi₅-Based Metal Hydride Electrode in Ni-MH Rechargeable Cells"
U.S. Patent No. 5,888,665 issued March 30, 1999.

I. E. Anderson, T. W. Ellis, R. C. Bowman, Jr. C. Witham, B. Fultz, and B. V. Ratnakumar, "Ultrafine Hydrogen Storage Powders"
U.S. Patent No. 6,074,453 issued June 13, 2000.

J. Graetz, B. Fultz, C. C. Ahn, and R. Yazami, "High Capacity Li Alloys of Nanophase Si", patent application #20040126659 originally filed 9/10/03, serial # 660382.

J. A. Graetz, B. Fultz, C. C. Ahn, and R. Yazami, "High Capacity Nanostructured Germanium-Containing Materials and Lithium Alloys Thereof" U.S. Patent No. 7,781,102 B2 issued Aug. 24, 2010.

A. Dailly, C. C. Ahn, R. Yazami and B. Fultz, "Methods for Purifying Carbon Materials" U.S. Patent No. 7,537,682 issued May 26, 2009.

Y. Reynier, R. Yazami and B. Fultz, "Electrochemical Thermodynamic Measurement System", U.S. Patent No. 7,595,611 issued Sept. 29, 2009.

R. Yazami, J. McMenamin, Y. Reynier and B. Fultz "A Battery State of Health Assessment System" US Patent 8,446,127 issued May 21, 2013.

R. Yazami, J. McMenamin, Y. Reynier and B. Fultz "Methods for Thermodynamic Evaluation of Battery State of Health" US Patent 8,901,892 issued Dec. 2, 2014.

Nicholas P. Stadie, Brent T. Fultz, Channing Ahn, and Maxwell Murialdo, "Nanostructured carbon materials for adsorption of methane and other gases," U.S. Patent 9,067,848 B2 issued June 30, 2015.

N.J. Weadock, H-J. Tan, B. Fultz and Heng Yang, "Metal Hydride Alloys with Improved Rate Performance" U.S. Patent 10,211,457 B2 issued Feb. 19, 2019.

Heng Yang, Nicholas J. Weadock, Brent T. Fultz, Bryce W. Edwards,
"High Capacity Corrosion Resistant V-Based Metal Hydride Electrodes
For Rechargeable Metal Hydride Batteries," U.S. Patent Number:
10,573,932 Issued: Feb. 25, 2020.

Textbooks

1. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials, (Springer-Verlag, Heidelberg 2001). ISBN 3-540-67841-7. Drafts used as course text since 1991.
See reviews: Ray Egerton, *Micron*, in press (2002).
John Hutchison, *J. Microscopy* 204 (2001) 263-264.
2. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials Second Edition, (Springer-Verlag, Heidelberg 2002). ISBN: 3-540-43764-9. Third printing 2005. Fourth printing 2006.
3. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials Third Edition, (Springer-Verlag, Heidelberg 2007). ISBN: 978-3-540-73885-5. Fifth printing 2007. Translation into Russian by Technosphaera in 2008. Sixth printing (corrected third edition) 2009.
4. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials Third Edition, (Springer-Verlag, Heidelberg 2013). Russian translation by Technosphaera.
5. Brent Fultz and James M. Howe, Transmission Electron Microscopy and Diffractometry of Materials Fourth Edition, (Springer-Verlag, Heidelberg 2013). ISBN 978-3-642-29760-1. ISSN 1868-4513.
6. Brent Fultz and James M. Howe, Worked Solutions to Problems in Transmission Electron Microscopy and Diffractometry of Materials. Restricted access web site.
7. Brent Fultz, Phase Transitions in Materials, (Cambridge University Press, Cambridge 2014). ISBN 978-1-107-06724-0.
8. Brent Fultz, Phase Transitions in Materials Second Edition (Cambridge University Press, Cambridge 2020). ISBN 978-1-108-48578-4.
9. Brent Fultz, Phase Transitions in Materials: Online Chapters (California Institute of Technology, Pasadena 2020). <https://authors.library.caltech.edu/92759/>
10. Brent Fultz, Worked Solutions to Problems in Phase Transitions in Materials, Restricted access web sites for First and Second editions.
11. Brent Fultz, Tim Kelley, Jiao Lin, JaeDong Lee, Olivier Delaire, Max Kresch, Mike McKerns, Michael Aivazis, Experimental Inelastic Neutron Scattering with a Chopper Spectrometer, and virtual neutron scattering with a computer. Open source textbook. 367 pages, March 2020 edition.
http://www.its.caltech.edu/~matsci/btfgrp/Inelastic_Neutron_Book.pdf

Brent Fultz, Tim Kelley, Mike McKerns, Jiao Lin, JaeDong Lee, Hillary Smith, Olivier Delaire, Inelastic Scattering 392 pages. May, 2021 (for MS 171)
http://www.its.caltech.edu/~matsci/btfgrp/Inelastic_Book.pdf

Books Edited:

12. M. M. Disko, C. C. Ahn, and B. Fultz, eds., Transmission Electron Energy Loss Spectrometry in Materials Science, TMS EMPMD Monograph Series Vol. 2 (TMS, Warrendale, 1992) ISBN Number 0-87339-180-2.
(see glowing review in MSA Bulletin, 1995)
13. B. Fultz, R. W. Cahn, and D. Gupta, eds., Diffusion in Ordered Alloys, TMS EMPMD Monograph Series Vol. 3 (TMS, Warrendale, 1993) ISBN Number 0-87339-204-3.
14. L.Q. Chen, B. Fultz, J. W. Cahn, J. R. Manning, J. E. Morral and J. Simmons, eds., Mathematics of Microstructure Evolution, joint publication of (TMS, Warrendale, PA) TMS ISBN No. 0-87339-351-1 and (SIAM, Philadelphia, PA) SIAM ISBN No. 0-89871-386-2.
15. E. Ma, B. Fultz, R. Shull, J. Morral, and P. Nash, eds., Chemistry and Physics of Nanocrystalline and Related Non-Equilibrium Materials, (TMS, Warrendale) (TMS, Warrendale, PA, 1997), ISBN No. 0-87339-358-8.
16. B. Fultz, "Nuclear and Electron Resonance Spectroscopies in Materials Research", Volume 9 in Methods in Materials Research: A Current Protocols Publication. Elton Kaufmann, et al., eds. (John Wiley, New York, 2000). ISBN 0-471-18531-0.
17. B. Fultz, "Electron Methods in Materials Research", Volume 11 in Methods in Materials Research: A Current Protocols Publication. Elton Kaufmann, et al., eds. (John Wiley, New York, 2000). ISBN 0-471-18531-0.

Book Chapter (royalties)

18. Brent Fultz, "Chemical Systematics of Iron-57 Hyperfine Magnetic Field Distributions in Iron Alloys", Chapter 1 in Mössbauer Spectroscopy Applied to Magnetism and Materials Science Vol. I, G. J. Long and Fernande Grandjean, eds., (Plenum Press, New York, 1993) pp. 1-31.
19. Brent Fultz, "Vibrational Entropy and Local Structures of Solids", in Local Structure from Diffraction, S. J. L. Billinge and M. F. Thorpe, eds. (Fundamental Materials Research Series, Plenum Press, New York, 1998) 273-294.
20. Brent Fultz, "Mössbauer Spectrometry", in Methods in Materials Research: A Current Protocols Publication. Elton Kaufmann (Ed. in Chief), edited by B. Fultz, et al. (John Wiley, New York, 2000) Unit 9.c.1.
21. James M. Howe and Brent T. Fultz, "Transmission Electron Microscopy", in Methods in Materials Research: A Current Protocols Publication. Elton

- Kaufmann (Ed. in Chief), edited by B. Fultz, et al. (John Wiley, New York, 2000) John Wiley, Unit 11a.2.
22. Brent Fultz "Introduction" in Transmission Electron Energy Loss Spectrometry in Materials Science and the EELS Atlas Second Edition, edited by C. C. Ahn (Wiley-VCH, Weinheim, 2004) Chapter 1 pp. 1-20.
 23. J.K. Okamoto, D.H. Pearson, A. Hightower, C.C. Ahn and B. Fultz "EELS of the Electronic Structure and Local Structure of Metals" in Transmission Electron Energy Loss Spectrometry in Materials Science and the EELS Atlas Second Edition, edited by C. C. Ahn (Wiley-VCH, Weinheim, 2004) Chapter 9 pp. 317-352.
 24. B. Fultz and J. J. Hoyt, "Phase Equilibria and Phase Transformations" Chapter 7 in Alloy Physics, edited by Wolfgang Pfeiler (Wiley-VCH, Weinheim, 2007). ISBN-10: 3-527-31321-4. ISBN-13: 978-3-527-31321-1.
 25. B. Fultz, "Vibrational Thermodynamics of Materials", *Progress in Materials Science* 55 (2010) pp. 247-352.
 26. Brent Fultz, "Mössbauer Spectrometry", in Characterization of Materials. Elton Kaufmann, Editor (John Wiley, New York, 2012) p. 1-21.
 27. James M. Howe, Brent T. Fultz, and Shu Miao, "Transmission Electron Microscopy", in Characterization of Materials. Elton Kaufmann, Editor (John Wiley, New York, 2012) p. 1675-1720.

Refereed Publications in Archival Journals

28. B. Fultz and J. W. Morris, Jr., "Multichannel Scaling with an Eight Bit Microcomputer", *Rev. Sci. Instr.* 49 (1978) 1216.
29. C. K. Syn, B. Fultz, and J. W. Morris, Jr., "Mechanical Stability of Retained Austenite in Tempered 9Ni Steel", *Metall. Trans.* 9A (1978) 1635-1640.
30. B. Fultz and J. W. Morris, Jr., "The Thickness Distortion of ⁵⁷Fe Backscatter Mössbauer Spectra", *Nucl. Instr. and Meth.* 188 (1981) 197-201.
31. B. Fultz and J. W. Morris, Jr., "The Thickness Distortion of ⁵⁷Fe Backscatter Mössbauer Spectra: Effects of Secondary Resonant Absorptions", *Nucl. Instr. and Meth.* 211 (1983) 569-570.
32. B. Fultz, A. DuBois, H. J. Kim, and J. W. Morris, Jr., "Cryogenic Mechanical Properties of Superalloy MP35N", *Cryogenics* 11 (1984) 687-690.
33. B. Fultz and J. W. Morris, Jr., "A Mössbauer Spectrometry Study of the Mechanical Transformation of Precipitated Austenite in 6Ni Steel", *Metall. Trans.* 16A (1985) 173-177.
34. B. Fultz, J. I. Kim, Y. H. Kim, H. J. Kim, G. O. Fior, and J. W. Morris, Jr., "The Stability of Precipitated Austenite and the Toughness of 9Ni Steel", *Metall. Trans.* 16A (1985) 2237-2249.

35. B. Fultz and J. W. Morris, Jr., "The Mechanical Stability of Precipitated Austenite in 9Ni Steel", *Metall. Trans.* 16A (1985) 2251-2256.
36. B. Fultz and J. W. Morris, Jr., "Effects of High Magnetic Fields on the Flow Stress of 18-8 Stainless Steels", *Acta Metall.* 34 (1986) 379-384.
37. B. Fultz and J. W. Morris, Jr., "The Temperature Dependence of the ⁵⁷Fe Hyperfine Field Distribution in Fe-Ni", *Hyperfine Interactions* 28 (1986) 553-556.
38. B. Fultz, J. I. Kim, Y. H. Kim, and J. W. Morris, Jr., "The Chemical Composition of Precipitated Austenite in 9Ni Steel", *Metall. Trans.* 17A (1986) 967-972.
39. B. Fultz and J. W. Morris, Jr., "The Temperature Dependence of Hyperfine Magnetic Fields in Fe-Ni", *Phys. Rev.* 34B (1986) 4480-4489.
40. B. Fultz, "Suppressed Kinetics of Short Range Ordering at Low Temperatures", *J. Chem. Phys.* 87 (1987) 1604-1609.
41. W. J. Meng, B. Fultz, E. Ma, and W. L. Johnson, "Solid State Interdiffusion Reactions in Ni/Ti and Ni/Zr Multilayered Thin Films", *Appl. Phys. Lett.* 51 (1987) 661-663.
42. D. H. Pearson, B. Fultz, and C. C. Ahn, "Measurement of 3d State Occupancy in Transition Metals Using Electron Energy Loss Spectrometry", *Appl. Phys. Lett.* 53 (1988) 1405-1407.
43. S. M. Anlage, B. Fultz, and K. M. Krishnan, "Icosahedral Phase Formation in Rapidly Quenched Aluminum-Ruthenium Alloys", *J. Materials Research*, 3 (1988) 421-425.
44. W. J. Meng, C. W. Nieh, E. Ma, B. Fultz, and W. L. Johnson, "Solid State Interdiffusion Reactions of Ni/Zr Diffusion Couples", *Materials Science and Engineering* 97 (1988) 87-91.
45. B. Fultz, "Short Range Order in FeCo-X Alloys", *Hyperfine Interactions*, 41 (1988) 607-610.
46. B. Fultz, "An Effect of Antiphase Boundaries on the Kinetics of Short Range Ordering by a Vacancy Mechanism", *J. Chem. Phys.* 88 (1988) 3227-3229.
47. Z. Mei, B. Fultz, and J. W. Morris, Jr., "Intensities of Backscatter Mössbauer Spectra", *J. Appl. Phys.* 64 (1988) 2550-2555.
48. B. Fultz, "Kinetic Paths in Two Order Parameters: Theory", *Acta Metall.* 37 (1989) 823-829.
49. B. Fultz, H. H. Hamdeh, and D. H. Pearson "Kinetic Paths in Two Order Parameters: A Mössbauer Spectrometry Experiment with FeCo-Mo", *Acta Metall.* 37 (1989) 2841-2847.
50. B. Fultz and H. H. Hamdeh, "Kinetics of Ordering in Metallic Alloys", *Hyperfine Interactions* 45 (1989) 55-72.

51. B. Fultz and L. Anthony. "Vacancy Trapping in Lattices with Different Coordination Numbers", *Phil. Mag. Lett.* 59 (1989) 237-241.
52. B. Fultz, G. Le Caër, and P. Matteazzi, "Mechanical Alloying of Fe and V Powders: Intermixing and Amorphous Phase Formation", *J. Mater. Res.* 4 (1989) 1450-1455.
53. L. Anthony and B. Fultz, "Kinetic Paths of B2 and DO₃ Order Parameters: Theory", *J. Mater. Res.* 4 (1989) 1132-1139.
54. L. Anthony and B. Fultz, "Kinetic Paths of B2 and DO₃ Order Parameters: Experiment", *J. Mater. Res.* 4 (1989) 1140-1142.
55. H. H. Hamdeh, B. Fultz, and D. H. Pearson "A Mössbauer Spectrometry Study of the Hyperfine Fields and Electronic Structure of Fe-Co Alloys", *Phys. Rev. B*, 39 (1989) 11233-11240.
56. B. Fultz and H. H. Hamdeh, "A Mössbauer Spectrometry Study of Ordering in Fe-Co", *Phil. Mag. B* 60 (1989) 601-615.
57. H. Ouyang and B. Fultz, "Percolation in Alloys with Thermally Activated Diffusion", *J. Appl. Phys.* 66 (1989) 4752-4755.
58. J. W. Morris, Jr., B. Fultz, J. W. Chan, and Z. Mei, "The Influence of High Magnetic Fields on the Mechanical Properties of Metastable Austenitic Stainless Steels", *Fizika Nizkikh Temperatur* 15 (1989) 1072-1080.
59. B. Fultz, H. H. Hamdeh, and J. Okamoto, "Hyperfine Magnetic Fields in Fe-Co Alloys and their Temperature Dependences", *Hyperfine Interactions* 54 (1990) 799-803.
60. B. Fultz, Z-Q. Gao and H. H. Hamdeh, "Short Range Ordering in Undercooled Fe₃Al", *Hyperfine Interactions*, 54 (1990) 521-526.
61. B. Fultz, "Kinetics of Short- and Long-Range B2 Ordering in the Pair Approximation", *J. Materials Research* 5 (1990) 1419-1430.
62. B. Fultz, "Nonintuitive Features of Disorder→Order Transformations", *J. Less-Common Metals*, 168 (1991) 145-157.
63. G. Le Caër, P. Matteazzi, E. Bauer-Grosse, B. Fultz, and A. Pianelli, "Mössbauer Study of Mechanical Alloying in Fe-V and Fe-C Alloys", *J. de Physique Colloque* 51 (1990) C4-151-155.
64. H. H. Hamdeh, J. Okamoto, and B. Fultz "Temperature-dependence of hyperfine magnetic fields in Fe-Co alloys", *Phys. Rev. B* 42 (1990) 6694-6696.
65. E. H. Fowles, J. A. Labinger, J. L. Beauchamp, and B. Fultz, "Fast Ion Conductors as Oxidation Catalysts: Oxidative Coupling and Deep Oxidation of Methane over Transition-Metal-Exchanged β"-Aluminas, *J. Phys. Chem.* 95 (1991) 7393-7400.
66. H. Kuwano, H. Ouyang, and B. Fultz, "A Mössbauer Spectrometry Study of Nanophase Cr-Fe Synthesized by Mechanical Alloying: A Measurement of Grain Boundary Width", *Nanostructured Materials*, 1 (1992) 143.

67. B. Fultz, "Kinetics of short-range and long-range B2 ordering in FeCo", *Phys. Rev. B* 44 (1991) 9805-9811.
68. J. Bach, B. Krueger, and B. Fultz, "Shock wave consolidation of a Ni-Cr-Si-B metallic glass powder", *Mater. Lett.* 11 (1991) 383-388.
69. S. R. Harris, D. H. Pearson, C. M. Garland, and B. Fultz, "Chemically Disordered Ni₃Al Synthesized by High Vacuum Evaporation", *J. Mater. Res.* 6 (1991) 2019-2021.
70. B. Fultz, "Kinetics of short- and long-range B2 ordering in ternary alloys", *J. Mater. Res.* 7 (1992) 946-954.
71. H. Kuwano, H. Ouyang, and B. Fultz, "A Mössbauer Spectrometry Study of the Magnetic Properties and Debye Temperature of Nanocrystalline Cr-Fe", *Materials Science Forum* 88-90 (1992) 561-568.
72. G. Le Caër, P. Matteazzi, and B. Fultz, "A Microstructural Study of the Mechanical Alloying of Fe and Sn Powders", *J. Mater. Res.* 7(6) (1992) 1387-1395.
73. B. Fultz, "Pseudo-stable States", *Philos. Mag. B* 67 (1993) 253-262.
74. L. Anthony, J. K. Okamoto, and B. Fultz, "Vibrational Entropy of Ordered and Disordered Ni₃Al", *Phys. Rev. Lett.* 70 (1993) 1128-1130.
75. H. Kuwano, H. Morita, Y. Hamaguchi, H. Ouyang, and B. Fultz, *J. Japan Society of Powder and Powder Metallurgy* 39 (1992) 1080-1084.
76. L. Anthony and B. Fultz, "Kinetics of B2, D0₃ and B32 ordering: Results from pair approximation calculations and Monte Carlo simulations", *J. Mater. Res.* 9 (1994) 348-356.
77. Z. Q. Gao and B. Fultz, "Transient B32-like order during the early stages of ordering in undercooled Fe₃Al", *Philos. Mag. B* 67 (1993) 787-800.
78. D. H. Pearson, C. C. Ahn, and B. Fultz, "White lines and d-electron occupancies for the 3d and 4d transition metals", *Phys. Rev. B* 47 (1993) 8471-8478.
79. R. C. Bowman, Jr., F. E. Lynch, R. W. Marmaro, C. H. Luo, B. Fultz, J. S. Cantrell, and D. Chandra, "Effects of Thermal Cycling on the Physical Properties of VH_x", *Z. Phys. Chem. N. F.*, 181 (1993) 827-831.
80. B. Fultz, C. C. Ahn, S. Spooner, L. B. Hong, J. Eckert and W. L. Johnson, "Incipient Chemical Instabilities of Nanophase Fe-Cu Alloys Prepared by Mechanical Alloying", *Metall. and Mater. Trans. A* 27 (1996) 2934-2946.
81. B. Fultz and Z.Q. Gao, "A Mössbauer spectrometry study of hyperfine magnetic fields and ordering in Fe₃Al", *Nucl. Instr. and Methods in Phys. Res.* B76 (1993) 115-120.
82. Z. Gao and B. Fultz, "The Thermal Stability of Nanocrystalline Fe-Si-Nb Prepared by Mechanical Alloying", *Nanostructured Materials* 2 (1993) 231-240.

83. H. H. Hamdeh, S. A. Oliver, B. Fultz and Z. Q. Gao, "Structure and magnetic properties of sputtered thin films of $\text{Fe}_{0.79}\text{Ge}_{0.21}$ ", J. Appl. Phys. 74 (1993) 5117-5123.
84. T. F. Lindsey and B. Fultz, "Microstructural dependence of vacancy diffusion in ordered alloys", J. Appl. Phys. 75 (1994) 1467-1472.
85. B. Fultz, Z-Q. Gao, H. H. Hamdeh, and S. A. Oliver, "Local and nonlocal isomer shifts in bcc Fe-X Alloys (X=Al,Si,Ga,Ge)", Phys. Rev. B 49 (1994) 6312-6315.
86. T. A. Stephens, W. Keune, and B. Fultz, "Mössbauer Effect Diffraction from Polycrystalline ^{57}Fe " Hyperfine Interactions, 92 (1994) 1095-1100.
87. Z. Gao and B. Fultz, "Thermal Stability of Fe_3Si -Based Nanocrystals" Hyperfine Interactions 94 (1994) 2213-2218.
88. H. H. Hamdeh, J. Kramer, B. Fultz, Z. Q. Gao, and S. A. Oliver, "Hyperfine Fields and Chemical Order in Fe-Ge" Hyperfine Interactions, 94 (1994) 2373-2378.
89. Z. Gao and B. Fultz, "Kinetics of Ordering in Fe_3Si ", Hyperfine Interactions 94 (1994) 2361-2366.
90. B. Fultz, H. Kuwano, and H. Ouyang, "Average Widths of Grain Boundaries in Nanophase Alloys Synthesized by Mechanical Attrition", J. Appl. Phys. 77 (1995) 3458-3466.
91. B. Fultz, "The Kinetic Stability of Alloys having Periodic Minimal Surface Microstructures", Philos. Mag. A 70 (1994) 607-619.
92. D. H. Pearson, C. C. Ahn, and B. Fultz, "Measurements of 3d occupancy from Cu $L_{2,3}$ electron energy loss spectra of rapidly quenched CuZr, CuTi, CuPd, CuPt, and CuAu", Phys. Rev. B 50 (1994) 12969-12972.
93. J. K. Okamoto, C. C. Ahn, and B. Fultz, "Short-range ordering in fcc Ni_3Al ", J. Appl. Phys. 77 (1995) 4380-4383.
94. R. C. Bowman, C. Luo, C. C. Ahn, C. K. Witham, and B. Fultz, "The Effect of Tin on the Degradation of $\text{LaNi}_{5-y}\text{Sn}_y$ Metal Hydrides during Thermal Cycling", J. Alloys Compounds 217 (1995) 185-192.
95. L. B. Hong, C. Bansal, and B. Fultz, "Steady State Grain Size and Thermal Stability of Nanophase Ni_3Fe and Fe_3X (X=Si, Zn, Sn) Synthesized by Ball Milling at Elevated Temperatures", NanoStructured Materials, 4 (1994) 949-956.
96. Z. Q. Gao and B. Fultz, "Inter-Dependence of Grain Growth, Nb Segregation, and Chemical Ordering in Fe-Si-Nb Nanocrystals", NanoStructured Materials 4 (1994) 939-947.
97. C. Bansal, B. Fultz, and W. L. Johnson, "Crystallization of Fe-B-Si Metallic Glass During Ball Milling", NanoStructured Materials, 4 (1994) 919-925.

98. B. V. Ratnakumar, C. K. Witham, G. Halpert, and B. Fultz, "Electrochemical Evaluation of La-Ni-Sn Metal Hydride Alloys", *J. Electrochem. Soc.*, 141 (1994) L89-L91.
99. L. Anthony, L. J. Nagel, J. K. Okamoto, and B. Fultz "The magnitude and origin of the difference in vibrational entropy between ordered and disordered Fe₃Al", *Phys. Rev. Lett.* 73 (1994) 3034-3037.
100. L. B. Hong, L. Anthony, and B. Fultz, "B2 and B32 ordering transformations of equiatomic bcc alloys with ballistic and thermal atom movements", *J. Mater. Res.* 10 (1995) 126-132.
101. C. Bansal, Z. Q. Gao, L. B. Hong, and B. Fultz, "Phases and phase stabilities of Fe₃X alloys (X=Al, As, Ge, In, Sb, Si, Sn, Zn) prepared by mechanical alloying", *J. Appl. Phys.* 76 (1994) 5961-5966.
102. C. Bansal, Z.Q. Gao, and B. Fultz, "Grain Growth and Chemical Ordering in (Fe,Mn)₃Si", *NanoStructured Materials* 5 (1995) 327-336.
103. L. B. Hong, C. C. Ahn, and B. Fultz, "The Debye Temperature of Nanocrystalline β-Sn Measured by X-Ray Diffraction", *J. Mater. Res.* 10 (1995) 2408-2410.
104. L. B. Hong and B. Fultz, "Effects of Ballistic Atom Movements on Ordering Transitions of Binary Alloys", *Phys. Rev. B* 51 (1995) 2687-2693.
105. B. Fultz, L. Anthony, J. L. Robertson, R. M. Nicklow, S. Spooner, and M. Mostoller, "Phonon Modes and Vibrational Entropy of Mixing in Fe-Cr", *Phys. Rev. B* 52 (1995) 3280-3285.
106. L. Anthony and B. Fultz, "Effects of early transition metal solutes on the D0₃-B2 critical temperature in Fe₃Al", *Acta Metall. Mater.* 43 (1995) 3885-3891.
107. M. O. Kientz, G. Le Caër, P. Delcroix, L. Fournes, B. Fultz, P. Matteazzi, and B. Malaman, "⁵⁷Fe and ¹¹⁹Sn Mössbauer Spectrometry Studies on Nanocrystalline Fe-Sn Solid Solutions", *NanoStructured Materials* 6 (1995) 617-620.
108. B. Fultz, L. Anthony, L. J. Nagel, R. M. Nicklow and S. Spooner, "Phonon densities of states and vibrational entropies of ordered and disordered Ni₃Al", *Phys. Rev. B* 52 (1995) 3315-3321.
109. L. B. Hong and B. Fultz, "Phase diagrams of bcc alloys at low temperatures with ballistic atom movements", *Phys. Rev. B* 52 (1995) 6230-6237.
110. L. J. Nagel, L. Anthony and B. Fultz, "Differences in vibrational entropy of disordered and ordered Cu₃Au", *Philos. Mag. Lett.* 72 (1995) 421-427.
111. L. B. Hong and B. Fultz, "Two-Phase Coexistence in Fe-Ni Alloys Synthesized by Ball Milling", *J. Appl. Phys.* 79 (1996) p. 3946-3955..
112. B. V. Ratnakumar, C. K. Witham, R. C. Bowman, Jr., A. Hightower, and B. Fultz, "Electrochemical Studies on LaNi_{5-x}Sn_x Metal Hydride Alloys", *Journal of the Electrochemical Society*, 143 (1996) p. 2578-2584.

113. B. Fultz, J. L. Robertson, T. A. Stephens, L. J. Nagel and S. Spooner, "Phonon density of states of nanocrystalline Fe prepared by high energy ball milling", *J. Appl. Phys.* 79 (1996) p. 8318-8322.
114. L. J. Nagel, B. Fultz, J. L. Robertson, and S. Spooner, "Vibrational entropy and microstructural effects on the thermodynamics of partially-disordered and ordered Ni₃V", *Phys. Rev. B* 55 (1997) p. 2903-2911.
115. T. A. Stephens and B. Fultz, "Chemical environment selectivity in Mössbauer diffraction from ⁵⁷Fe₃Al", *Phys. Rev. Lett.* 78 (1997) p. 366-369.
116. C. Witham, B. V. Ratnakumar, R. C. Bowman, Jr., A. Hightower, and B. Fultz, "Electrochemical Evaluation of LaNi_{5-x}Ge_x Metal Hydride Alloys", *J. Electrochem. Soc.*, 143 (1996) L205-L208.
117. H. N. Frase, L. J. Nagel, J. L. Robertson, and B. Fultz, "Vibrational Density of States in Nanocrystalline Ni₃Fe", *Philos. Mag. B* 75 (1997) 335-347.
118. G. Le Caër, P. Delcroix, B. Malaman, R. Welter, B. Fultz and E. Ressouche, "Comparison of Disorder Induced Thermally and by Ball Milling in Ni₂MnSn, *Materials Science Forum*, 235 (1997) pp. 583-588.
119. M. Birsan, B. Fultz, and L. Anthony "Magnetic properties of bcc Fe-Pd extended solid solutions", *Phys. Rev. B* 55 (1997) p. 11502-11506.
120. A. Hightower, R. C. Bowman, Jr., and B. Fultz, "Mechanical Alloying of Fe and Mg", *J. Alloys Compounds* 252 (1997) p. 238-244.
121. R. C. Bowman, Jr., C. K. Witham, B. Fultz, B. V. Ratnakumar, T. W. Ellis, and I. Anderson "Hydriding Behavior of Gas-Atomized AB₅ Alloys", *J. Alloys Compounds*, 253-254 (1997) pp. 613-616.
122. C. Witham, R. C. Bowman, Jr., and B. Fultz, "Gas-phase H₂ absorption and microstructural properties of LaNi_{5-x}Ge_x Alloys", *J. Alloys Compounds*, 253-254 (1997) pp. 574-578
123. L. J. Nagel, B. Fultz, and J. L. Robertson, "Phase Equilibria of Co₃V", *J. Phase Equilibria*, 18 (1997) p. 21-23.
124. R. Ravelo, J. Aguilar, M. Baskes, J. E. Angelo, B. Fultz, and B. L. Holian, "Free energy and vibrational entropy difference between ordered and disordered Ni₃Al", *Physical Review B* 57 (1998) p. 862-869.
125. L. J. Nagel, B. Fultz, and J. L. Robertson, "Vibrational Entropies of Phases of Co₃V Measured by Inelastic Neutron Scattering and Cryogenic Calorimetry", *Philos. Mag. B* 75 (1997) p. 681-699.
126. L. B. Hong and B. Fultz, "Two-Phase Coexistence in Fe-Cu Alloys Synthesized by Ball Milling at Two Intensities", *Acta Materialia* 46 (1998) p. 2937-2946.
127. C. K. Witham, A. Hightower, R. C. Bowman, Jr., B. V. Ratnakumar, and B. Fultz, "Electrochemical Properties of LaNi_{5-x}Ge_x Alloys in Ni-MH Batteries" *J. Electrochem. Soc.* 144 (1997) p. 3758-3764.

128. B. Fultz, C. C. Ahn, E. E. Alp, W. Sturhahn, T. S. Toellner, "Phonons in nanocrystalline ^{57}Fe ", *Phys. Rev. Lett.* **79** (1997) p. 937-940.
129. J. L. Robertson, H. N. Frase, P. D. Bogdanoff, M. E. Manley, B. Fultz and R. McQueeney "Phonon densities of states of $\gamma\text{-Ce}$ and $\delta\text{-Ce}$ measured by inelastic neutron scattering", *Philos. Mag. Lett.* **79** (1999) 297-304.
130. B. Fultz, T. A. Stephens, W. Sturhahn, T. S. Toellner, and E. E. Alp, "Local Chemical Environments and the Phonon Partial Densities of states of ^{57}Fe in $^{57}\text{Fe}_3\text{Al}$ ", *Phys. Rev. Lett.* **80** (1998) p. 3304-3307.
131. B. Fultz and T. A. Stephens, "Mössbauer Diffraction and Interference Studies of Polycrystalline Metals and Alloys", *Hyperfine Interactions* **113** (1998) p. 199-217.
132. H. Frase, B. Fultz and J. L. Robertson, "Phonons in nanocrystalline Ni_3Fe ", *Phys. Rev. B* **57** (1998) p. 898-905.
133. L. J. Nagel, L. Anthony, J. K. Okamoto, and B. Fultz, "An Experimental Study of the Difference in Vibrational Entropy between Ordered and Disordered Fe_3Al ", *Journal of Phase Equilibria* **18** (1997) p. 551-555.
134. P. D. Bogdanoff and B. Fultz, "Vibrational Entropies of Alloying and Compound Formation – Experimental Trends", *Philos. Mag. B* **79** (1999) 753-765.
135. G. Vandegrift and B. Fultz, "The Mössbauer Effect Explained", *American J. Physics* **66** (1998) p. 593-596.
136. C. C. Ahn, Y. Ye., B. V. Ratnakumar, C. K. Witham, R. C. Bowman, Jr., and B. Fultz, "Hydrogen Desorption and Adsorption Measurements on Graphite Nanofibers", *Appl. Phys. Lett.* **73** (1998) p. 3378-3380.
137. J. A. Dooley, C. A. Lindensmith, R. G. Chave, N. Good, J. Graetz, and B. Fultz "Magnetostriction of single crystal and polycrystalline $\text{Tb}_{0.60}\text{Dy}_{0.40}$ at cryogenic temperatures", *J. Appl. Phys.* **85** (1999) 6256-6258.
138. H. N. Frase, B. Fultz, S. Spooner, and J. L. Robertson, "A Small Angle Neutron Scattering and Mössbauer Spectrometry Study of Magnetic Structures in Nanocrystalline Ni_3Fe ", *J. Appl. Phys.* **85** (1999) 7097-7104.
139. H. N. Frase, R. D. Shull, L.-B. Hong, T. A. Stephens, Z.-Q. Gao, and B. Fultz, "Soft Magnetic Properties of Nanocrystalline Ni_3Fe and $\text{Fe}_{75}\text{Al}_{12.5}\text{Ge}_{12.5}$ ", *NanoStructured Materials* **11** (1999) 987-993.
140. Y. Ye, C. C. Ahn, C. K. Witham, B. Fultz, J. Liu, A. Rinzler, D. Colbert, K. Smith and R. Smalley, "Hydrogen Adsorption and Cohesive Energy of Single-Walled Carbon Nanotubes", *Appl. Phys. Lett.*, **74** (1999) p. 2307-2309.
141. P. D. Bogdanoff, B. Fultz, and S. Rosenkranz, "Vibrational Entropy of L1_2 Cu_3Au Measured by Inelastic Neutron Scattering", *Phys. Rev. B* **60** (1999) p. 3976-3981.
142. A. Hightower, P. Delcroix, G. Le Caër, C-K. Huang, B. V. Ratnakumar, C. C. Ahn, and B. Fultz, "A ^{119}Sn Mössbauer Spectrometry Study of Li-SnO Anode Materials for Li-ion Cells", *J. Electrochem. Soc.* **147** (2000) p. 1-8.
143. M. C. Smart, B. V. Ratnakumar, S. Surampudi, Y. Wang, X. Zhang, S. G. Greenbaum, A. Hightower, C. C. Ahn and B. Fultz, "Irreversible Capacities of

- Graphite in Low Temperature Electrolytes for Lithium-Ion Batteries", *J. Electrochem. Soc.*, **146** (1999) 3963-3969.
144. J. L. Robertson, B. Fultz and H. N. Frase, "Phonon Contributions to the Entropies of hP24 and fcc Co₃V", *Phys. Rev. B* **60** (1999) 9329-9334.
 145. B. Fultz, T. A. Stephens, E. E. Alp, M. Y. Hu, J. P. Sutter, T. S. Toellner, and W. Sturhahn, "Atom clusters and vibrational excitations in chemically-disordered Pt₃⁵⁷Fe", *Phys. Rev. B* **61** (2000) 14517-14522.
 146. R. J. McQueeney, M. E. Manley, B. Fultz, G. Kwei, R. Osborn, and P. D. Bogdanoff, "Unexpected similarity of the dynamic magnetic susceptibility of γ -cerium and β -cerium", *Philos. Mag. B* **81** (2001) 675-687.
 147. M. E. Manley, B. Fultz, and L. J. Nagel, "Heat capacity and microstructure of ordered and disordered Pd₃V", *Philos. Mag. B* **80** (2000) 1167-1178.
 148. H. N. Frase, B. Fultz, J. L. Robertson and S. Spooner, "Structural Relaxation within the Grain Boundaries of Nanocrystalline Ni₃Fe", *Philos. Mag. B* **80** (2000) 1545-1554.
 149. B. Fultz and H. N. Frase, "Grain Boundaries of Nanocrystalline Materials — their Widths, Compositions, and Internal Structures", *Hyperfine Interactions* **130** (2000) pp. 81-108.
 150. J. Graetz, N. Good, B. Fultz, J. Dooley and R. Chave, "Magneto-Mechanical Effects in Polycrystalline Tb₇₆Dy₂₄", *J. Appl. Phys.* **87** (2000) 5795-5797.
 151. A. Hightower, C. C. Ahn, B. Fultz, and P. Rez, "Electron Energy Loss Spectrometry on Lithiated Graphite", *Applied Phys. Lett.* **77** (2000) 238-240.
 152. Y. Ye, C. C. Ahn, and B. Fultz, J. J. Vajo and J. Zinck, "Hydrogen Adsorption and Phase Transformations in Fullerite", *Applied Phys. Lett.*, **77** (2000) p. 2171-2173.
 153. M. E. Manley, R. J. McQueeney, J. L. Robertson, B. Fultz, and D. A. Neuman, "Phonon densities of states of γ -cerium and δ -cerium measured by TOF inelastic neutron scattering", *Philos. Mag. Lett.* **80** (2000) 591-596.
 154. U. Kriplani, M. W. Regehr, and B. Fultz, "A Mössbauer Effect Powder Diffractometer", *Hyperfine Interact.* **139** (2002) 667-672.
 155. P. Bogdanoff and B. Fultz, "The role of phonons in the thermodynamics of the martensitic transformation in NiTi", *Philos. Mag. B* **81** (2001) p. 299-311.
 156. L. Pasquini, A. Rempel, R. Würschum, K. Reimann, M. A. Müller, B. Fultz, and H.-E. Schaefer, "Thermal vacancy formation and D0₃-ordering in nanocrystalline intermetallic (Fe₃Si)₉₅Nb₅", *Phys. Rev. B* **63** (2001) 134114.
 157. M. E. Manley, B. Fultz, R. J. McQueeney, C. Brown, W. L. Hulst, J. L. Smith, D. J. Thoma, R. Osborn, and J. L. Robertson, "Large harmonic softening of the phonon density of states of uranium", *Phys. Rev. Lett.* **86** (2001) p. 3076-3079.
 158. M. E. Manley, R. J. McQueeney, B. Fultz, G. Kwei, R. Osborn, and P. D. Bogdanoff, "Vibrational and electronic entropy of β -cerium and γ -cerium measured by inelastic neutron scattering" *Phys. Rev. B* **65** (2002) 144111.
 159. B. Chen, D. Penwell, M. B. Kruger, A. F. Yue and B. Fultz "Nanocrystalline Iron at High Pressure", *J. Appl. Phys.* **89** (2001) p. 4794-4796.

160. B. Fultz, C. K. Witham, and T. J. Udovic, "Distributions of Hydrogen and Strains in LaNi_5 and $\text{LaNi}_{4.75}\text{Sn}_{0.25}$ ", *J. Alloys and Compounds*, 335 (2002) pp. 165-175.
161. U. Kriplani, J. Y. Y. Lin, M. Regehr, and B. Fultz, "Intensities of Mössbauer powder diffractions from ^{57}Fe ", *Phys. Rev. B* 65 (2001) 024405.
162. P. D. Bogdanoff B. Fultz, J. L Robertson, and L. Crow, "The temperature-dependence of the phonon entropy of vanadium", *Phys. Rev. B* 65 (2001) 014303-1 to 6.
163. B. Fultz, T. A. Stephens, J. Y. Y. Lin, and U. Kriplani, "Mössbauer diffractometry on polycrystalline $^{57}\text{Fe}_3\text{Al}$," *Phys. Rev. B* 65 (2002) 064419.
164. R. Yazami, H. Gabrisch, and B. Fultz, "Self-organised carbon nanostrips with a new LiC_{10} structure derived from carbon nanotubes", *J. Phys. Chem. B*, 115 (2001) pp. 10585-10588.
165. T. Ziller, G. Le Caër, O. Isnard, P. Cénédèse, and B. Fultz, "Metastable and transient states of B2 chemical ordering in Fe-V nanocrystalline alloys", *Phys. Rev. B* 65 (2001) 024204.
166. J. Y. Y. Lin, U. Kriplani, M. Regehr, and B Fultz, "Polarization Factors for ^{57}Fe Mössbauer Diffractions from Polycrystals", *Hyperfine Interact.* 136 (2001) pp. 663-672.
167. J. Graetz, A. Hightower, C. C. Ahn, R. Yazami, P. Rez and B. Fultz, "Electronic Structure of Chemically-Delithiated LiCoO_2 Studied by Electron Energy Loss Spectrometry", *J. Phys. Chem. B* 106 (2002) pp. 1286-1289.
168. J. Y. Y. Lin, B. Fultz, and U. Kriplani, "Mössbauer Diffractometry on Chemical Sites of ^{57}Fe in Fe_3Al ," *Hyperfine Interact.* 141 (2002) 145-150.
169. A. F. Yue, I. Halevy, A. Papandrew, P. D. Bogdanoff, B. Fultz, W. Sturhahn, E. E. Alp, and T. S. Toellner, "Mass Effects on Optical Phonons in L_{12} -Ordered $\text{Pt}_3^{57}\text{Fe}$ and $\text{Pd}_3^{57}\text{Fe}$ ", *Hyperfine Interact.* 141 (2002) 249-253.
170. N. Good, J. Dooley, and B. Fultz, "Magnetomechanical damping by polycrystalline TbDy ", *J. Appl. Phys.* 91 (2002) pp. 7824-7826.
171. H. Gabrisch, R. Yazami, and B. Fultz, "The Character of Dislocations in LiCoO_2 ", *Electrochem. and Solid State Lett.* 5 (2002) A111-A114.
172. R. C. Bowman, Jr., and B. Fultz, "Metallic Hydrides I: Hydrogen storage and other gas-phase applications" L. Schlapbach and R. W. Cahn, eds., *MRS Bulletin*, 27 (Sept. 2002) pp. 688-693.
173. J. Graetz, A. Hightower, C. C. Ahn, P. Rez, and B. Fultz, "An electron energy-loss spectrometry study of the electronic structure and radiation damage of lithium halides", *Phys. Rev. B*. submitted.
174. M. E. Manley, B. Fultz, D. W. Brown, B. Clausen, A. C. Lawson, J. C. Cooley, W. Hulst, R. J. Hanrahan, and J. L. Smith, "Microstructural strain energy of α -uranium determined by calorimetry and neutron diffractometry," *Phys. Rev. B*. 66 (2002) art. no. 024117.
175. J. Y. Y. Lin and B. Fultz, "Site-Specific Long-Range Order in $^{57}\text{Fe}_3\text{Al}$ Measured by Mössbauer Diffractometry", *Philos. Mag.* 83 (2003) 2621-2640.
176. J. Graetz, C. C. Ahn, R. Yazami and B. Fultz "An Electron Energy-Loss Spectrometry Study of Charge Compensation in $\text{LiNi}_{0.8}\text{Co}_{0.2}\text{O}_2$ " *J. Phys. Chem B*, 107 (13): 2887-2891 (2003).

177. Y. Ozawa, R. Yazami, and B. Fultz "Study of Self-Discharge of LiCoO₂ Cathode Materials", *J. Power Sources*, 119 (2003) 918-923.
178. H. Gabrisch, R. Yazami, and B. Fultz "A Transmission Electron Microscopy Study of Cycled LiCoO₂", *J. Power Sources*, 119 (2003) 674-679.
179. Y. Reynier, R. Yazami, and B. Fultz "The Entropy and Enthalpy of Lithium Intercalation into Graphite", *J. Power Sources*, 119 (2003) 850-855.
180. P. D. Bogdanoff, T. Swan-Wood, and B. Fultz, "The phonon entropy of alloying and ordering of Cu-Au", *Phys. Rev. B*, 68 (1): art. no. 014301 July 1, 2003.
181. M. E. Manley, B. Fultz, T. Swan-Wood, O. Delaire, R. J. McQueeney, E. A. Goremychkin, J. C. Cooley, W. L. Hults, J. C. Lashley, R. Osborn, J. L. Smith "No role for phonon entropy in the fcc→fcc volume collapse transition in Ce_{0.9}Th_{0.1} at ambient pressure", *Phys. Rev. B*, 67 (1): art. no. 014103 (2003).
182. J. Graetz, C. C. Ahn, R. Yazami and B. Fultz, "Highly Reversible Lithium Storage in Nanostructured Silicon", *Electrochemical and Solid-State Letters* 6 (2003) A194-197.
183. Y. Reynier, R. Yazami and B. Fultz, "Thermodynamics of lithium intercalation into graphites and disordered carbons" *J. Electrochem. Soc.* 151 (2004) A422-A426.
184. H. Gabrisch, R. Yazami and B. Fultz, "The Hexagonal to Cubic Spinel Transformation in Lithiated Cobalt Oxide: A Transmission Electron Microscopy Investigation", *J. Electrochem. Soc.* 151 (2004) A891-A897
185. R. J. McQueeney, A. C. Lawson, A. Migliori, T. M. Kelley, B. Fultz, M. Ramos, B. Martinez, J.C. Lashley and S. Vogel, "Unusual phonon softening in δ -phase plutonium", *Phys. Rev. Lett.* 92(14) (2004) 146401.
186. J. J. Vajo, F. Mertens, C. C. Ahn, R. C. Bowman, Jr., and B. Fultz, "Altering Hydrogen Storage Properties by Hydride Destabilization through Alloy Formation: LiH and MgH₂ Destabilized with Si" *J. Phys. Chem. B* 108, 13977-13983 (2004).
187. R. Yazami, Y. Ozawa, H. Gabrisch and B. Fultz, "Mechanism of electrochemical performance decay in LiCoO₂ aged at high voltage" *Electrochimica Acta* 50 (2-3): 385-390 Sp. Iss. SI, Nov. 30, 2004.
188. A. B. Papandrew, A. F. Yue, B. Fultz, I. Halevy, W. Sturhahn, T. S. Toellner, E. E. Alp, and H-K. Mao, "Vibrational modes in nanocrystalline iron under high pressure", *Phys. Rev. B* 69, 144301 (2004).
189. J. Y. Y. Lin and B. Fultz, "Mössbauer Diffractometry Measurements of Site-Specific Long-Range Order in ⁵⁷Fe₃Al", *Zeitschrift fuer Kristallographie* 219 (2004) 172-178.
190. J. Graetz, C. C. Ahn, R. Yazami and B. Fultz, "Nanocrystalline and Thin Film Germanium Electrodes with High Lithium Capacity and High Rate Capabilities", *J. Electrochem. Soc.* 151 (2004) A698-A702.
191. J. Graetz, C. C. Ahn, H. Ouyang, P. Rez, and B. Fultz, "White lines and d-occupancy for the 3d transition metal oxides and lithium transition-metal oxides", *Phys. Rev. B* 69, 235104 (2004).
192. Y. Reynier, J. Graetz, T. Swan-Wood, P. Rez, R. Yazami, and B. Fultz, "The Entropy of Li Intercalation in Li_xCoO₂", *Phys. Rev. B*, 70 (17): Art. No. 174304 Nov. 2004.

193. A. F. Yue, A. B. Papandrew, O. Delaire, B. Fultz, Z. Chowdhuri, R. Dimeo and D. A. Neumann, "Vibrations of micro-eV energies in nanocrystalline microstructures", *Phys. Rev. Lett.*, 93 (20): Art. No. 205501 Nov. 12, 2004.
194. O. Delaire, T. Swan-Wood, and B. Fultz, "Negative entropy of mixing for solutions of vanadium-platinum", *Phys. Rev. Lett.*, 93 (18): Art. No. 185704 Oct. 29, 2004.
195. T. Swan-Wood, O. Delaire, and B. Fultz, "Vibrational Entropy of Spinodal Decomposition in FeCr", *Phys. Rev. B*, 72 (2): Art. No. 024305 July 2005.
196. A. Dailly, J. W. L. Yim, C. C. Ahn, E. Miura, R. Yazami, and B. Fultz, "Purification of carbon single-wall nanotubes by potassium intercalation and exfoliation," *Appl. Phys. A* 80 (2005) p. 717-722.
197. O. Delaire, M. Kresch, and B. Fultz, "Vibrational entropy of the $\gamma - \alpha$ martensitic transformation in Fe₇₁Ni₂₉", *Philos. Mag.* 85 (2005) 3567-3583.
198. S. Miao, M. Kocher, P. Rez, B. Fultz, Y. Ozawa, R. Yazami, and C.C. Ahn, "Local electronic structure of layered Li_xNi_{0.5}Mn_{0.5}O₂ and Li_xNi_{1/3}Mn_{1/3}Co_{1/3}O₂", *J. Phys. Chem.* 109 (2005) 23473-23479.
199. J. Dodd, R. Yazami, and B. Fultz, "Phase Diagram of Li_xFePO₄", *Electrochem. Solid State Lett.* 9 (2006) pp. A151-A155.
200. Y. Ozawa, R. Yazami, and B. Fultz, "An XRD study of chemical self-discharge in delithiated cobalt oxide" *Electrochem. Solid State Lett.* 8 (2005) p. A38-A41.
201. O. Delaire and B. Fultz, "Charge Redistribution and Phonon Entropy of Vanadium Alloys", *Phys. Rev. Lett.* 97, 245701 (2006).
202. A.B. Papandrew, M. Lucas, R. Stevens, B. Fultz, M. Hu, M. Somayazulu, R.E. Cohen, I. Halevy, "Absence of Magnetism in Hcp Iron-Nickel at 11 K", *Phys. Rev. Lett.*, 97 (8): Art. No. 087202 Aug. 25, 2006.
203. J. Dodd, I. Halevy, and B. Fultz, "Valence Fluctuations of ⁵⁷Fe in Disordered Li_{0.6}FePO₄", *J. Phys. Chem. C Lett.*, 111, 1563-1566 (2007).
204. R. Stevens, J. L. Dodd, M. G. Kresch, R. Yazami, B. Fultz, B. Ellis, and L. F. Nazar, "Phonons and Thermodynamics of Unmixed and Disordered Li_{0.6}FePO₄" *J. Phys. Chem. B*, 110 (45): 22732-22735 Nov. 16 2006.
205. Y. Reynier, R. Yazami, B. Fultz and I. Barsukov, "Evolution of lithiation thermodynamics with the graphitization of carbons", *J. Power Sources* 165 (2): 552-558 (2007).
206. Y. Reynier, R. Yazami and B. Fultz, "XRD evidence of macroscopic composition inhomogeneities in the graphite-lithium electrode", *J. Power Sources* 165 (2): 616-619 (2007).
207. Matthew S. Lucas, A. Papandrew, B. Fultz and M.Y. Hu "Partial Phonon Densities of States of ⁵⁷Fe in Fe-Cr: Analysis by a Local-Order Cluster Expansion", *Phys. Rev. B* 75, 054307 (2007).
208. M. Kresch, O. Delaire, R. Stevens, J.Y.Y. Lin, and B. Fultz "Neutron scattering measurements of phonons in nickel at elevated temperature", *Phys. Rev. B* 75, 104301 (2007).
209. O. Prytz, J. Taftø, C.C. Ahn, and B. Fultz, "Transition metal d-band occupancy in skutterudites studied by electron energy-loss spectroscopy" *Physical Review B*, 75 (12): Art. No. 125109 (2007).

210. S. Miao, M. Kocher, P. Rez, B. Fultz, R. Yazami, and C.C. Ahn, "Local electronic structure of Olivine Phases of Li_xFePO_4 ", *J. Phys. Chem. A* **111** (20): 4242-4247 (2007).
211. M. Kresch, M. Lucas, and B. Fultz, "Phonons in aluminum at high temperatures studied by inelastic neutron scattering", *Phys. Rev. B* **77**, 024301 (2008).
212. Matthew S. Lucas, M. Kresch, R. Stevens, and B. Fultz "Phonon Partial Densities of States and Entropies of Fe and Cr in bcc Fe-Cr from Inelastic Neutron Scattering," *Phys. Rev. B* **77**, 184303 (2008).
213. J. B. Keith, H. Wang, B. Fultz, and J. P. Lewis, "Ab initio free energy of vacancy formation and mass-action kinetics in vis-active TiO_2 " *J. Phys.: Condens. Matter* **20** (2008) 022202.
214. O. Delaire, M.G. Kresch, J.A. Munoz, M.S. Lucas, J.Y.Y. Lin, and B. Fultz, "Electron-Phonon Interactions and High-Temperature Thermodynamics of Vanadium and its Alloys", *Phys. Rev. B*, **77**, 214112 (2008).
215. J. Purewal, S.-J. Hwang, R.C. Bowman, Jr., E. Ronnebro, B. Fultz, and C. Ahn, "Hydrogen Sorption Behavior of the $\text{ScH}_2\text{-LiBH}_4$ System: Experimental Assessment of Chemical Destabilization Effects," *J. Phys. Chem. C* **112**, 8481 (2008).
216. M. L. Winterrose, M. S. Lucas, A. F. Yue, I. Halevy, Jingzhu Hu, M. Lerche, B. Fultz, "Pressure-Induced Electronic Transition and Invar Behavior in Pd_3Fe ", *Phys. Rev. Lett.*, **102**, 237202 (2009).
217. O. Delaire, M.S. Lucas, J.A. Munoz, M. Kresch, and B. Fultz, "Adiabatic Electron-Phonon Interaction and High-Temperature Thermodynamics of the A15 Compounds V_3X ", *Phys. Rev. Lett.* **101**, 105504 (2008).
218. A.D. Christianson, M.D. Lumsden, O. Delaire, M.B. Stone, D.L. Abernathy, M.A. McGuire, A.S. Sefat, R. Jin, B.C. Sales, D. Mandrus, E.D. Mun, P.C. Canfield, J.Y.Y. Lin, M. Lucas, M. Kresch, J.B. Keith, B. Fultz, E.A. Goremychkin, and R.J. McQueeney, "Phonon Density of States of $\text{LaFeAsO}_{1-x}\text{F}_x$ ", *Phys. Rev. Lett.* **101**, 157004 (2008). (Also Published online in: *Virtual Journal of Applications of Superconductivity* (October 15, 2008) Vol. 15 (8) <http://www.vjsuper.org/super/>)
219. J. Purewal, H. Kabbour, J.J. Vajo, C.C. Ahn, and B. Fultz, "Pore size distribution and supercritical hydrogen adsorption in activated carbon fibers" *Nanotechnology* **20**, 204012 (2009).
220. H. Tan, J. Dodd, and B. Fultz, "A Mössbauer Spectrometry Study of Thermally-Activated Electronic Processes in Li_xFePO_4 " *J. Phys. Chem. C*. **113**, 2526-2531 (2009).
221. J. Purewal, J.B. Keith, C.C. Ahn, and B. Fultz, C.M. Brown and M. Tyagi, "Adsorption and melting of hydrogen in potassium-intercalated graphite," *Phys. Rev. B* **79**, 054305 (2009).

222. C.W. Li, M.M. McKerns, and B. Fultz, "Raman spectrometry study of phonon anharmonicity of hafnia at elevated temperatures", *Phys. Rev. B* 80, 054304 (2009).
223. B. Fultz, "Vibrational Thermodynamics of Materials," *Progress in Materials Science* 55, 247-352 (2010).
224. M.S. Lucas, O. Delaire, M.L. Winterrose, T. Swan-Wood, M. Kresch, I. Halevy, B. Fultz, J. Hu, M. Lerche, M.Y. Hu, M. Somayazulu, "Effects of Vacancies on Phonon Entropy of B2 FeAl", *Phys. Rev. B* 80, 214303 (2009).
225. H.J. Tan, J.L. Dodd, and B. Fultz, "Thermodynamic and Kinetic Stability of the Solid Solution Phase in Nanocrystalline Li_xFePO_4 " *J. Phys. Chem. C* 113, 20527 (2009).
226. Nicholas Stadie, Justin Purewal, Channing Ahn and Brent Fultz, "Measurements of Hydrogen Spillover in Platinum Doped Superactivated Carbon" *Langmuir* 26, 15481-15485 (2010).
227. M. S. Lucas, J. A. Muñoz, L. Mauger, Chen W. Li, B. Fultz, A. Sheets, Z. Turgut, J. Horwath, D. L. Abernathy, M. B. Stone, O. Delaire, and Yuming Xiao, "Effects of chemical composition and B2 order on phonons in bcc Fe-Co alloys" *J. Appl. Phys.* 108, 023519 (2010).
228. J. Brandon Keith, Jacob R. Fennick, Daniel R. Nelson, Chad E. Junkermeier, Jiao Y. Y. Lin, Chen W. Li, Michael M. McKerns, James P. Lewis and Brent Fultz, "AtomSim: Web-deployed Atomistic Dynamics Simulator", *J. Applied Crystallography* 43, 1553-1559 (2010).
229. Xiaoli Tang, Chen W. Li, B. Fultz, "Anharmonicity-induced phonon broadening in aluminum at high temperatures", *Phys. Rev. B*, 82, 184301 (2010).
230. M.S. Lucas, J.A. Muñoz, O. Delaire, N. Markovskiy M.B. Stone, D. L. Abernathy, I. Halevy, L. Mauger, J.B. Keith, M.L. Winterrose, Yuming Xiao, M. Lerche, and B. Fultz, "Effects of composition, temperature, and magnetism on phonons in bcc Fe-V alloys", *Phys. Rev. B* 82, 144306 (2010).
231. C.W. Li, M.M. McKerns, and B. Fultz, "Raman spectrometry study of phonon anharmonicity of zirconia at elevated temperatures", *J. Amer. Ceramic Soc.* 94, 125-130 (2011).
232. M.L. Winterrose, L. Mauger, I. Halevy, A.F. Yue, M.S. Lucas, J.A. Muñoz, H. Tan, Y. Xiao, P. Chow, W. Sturhahn, T.S. Toellner, E.E. Alp, and B. Fultz. "Dynamics of iron atoms across the pressure-induced Invar transition in Pd_3Fe ", *Phys. Rev. B* 83, 134304 (2011).
233. H. Tan and B. Fultz "Rapid Electron Dynamics at Fe Atoms in Nanocrystalline Li_xFePO_4 Studied by Mössbauer Spectrometry", *J. Phys. Chem. C* 115, 7787-7792 (2011).
234. N. D. Markovskiy, J. A. Muñoz, M. S. Lucas, Chen W. Li, O. Delaire, M. B. Stone, D. L. Abernathy and B. Fultz, "Non-harmonic phonons in MgB_2 at elevated temperatures", *Phys. Rev. B* 83, 174301 (2011).

235. J. A. Muñoz, M. S. Lucas, O. Delaire, M. L. Winterrose, L. Mauger, Chen W. Li, A. O. Sheets, M. B. Stone, D. L. Abernathy, Yuming Xiao, Paul Chow, and B. Fultz, "Positive vibrational entropy of chemical ordering in FeV" *Phys. Rev. Lett.* **107**, 115501 (2011).
236. Chen W. Li, Xiaoli Tang, J. A. Muñoz, J.B. Keith, S. J. Tracy, D. L. Abernathy, and B. Fultz, "The structural relationship between negative thermal expansion and anharmonicity of cubic ScF₃", *Phys. Rev. Lett.* **107**, 195504 (2011).
- J. Paul Attfield, "Condensed-matter physics: A fresh twist on shrinking materials," *Nature* **480**, 465466 (22 December 2011) doi:10.1038/480465a.
- Jon Evans, "Vibration makes bonds stronger," *Chemistry and Industry* **23**, 7 (2011).
- Also see focus article in *Physics* **4**, 90 (2011).
237. Xiaoli Tang and B. Fultz, "A first-principles study of phonon linewidths in noble metals", *Phys. Rev. B* **84**, 054303 (2011).
238. D. L. Abernathy, M. B. Stone, M. J. Loguillo, M. S. Lucas, O. Delaire, X. Tang, J. Y. Y. Lin and B. Fultz, "Design and operation of the wide angular-range chopper spectrometer ARCS at the SNS", *Rev. Sci. Instrum.* **83**, 015114 (2012); doi: 10.1063/1.3680104.
239. Nicholas P. Stadie, John J. Vajo, Robert W. Cumberland, Andrew A. Wilson, Channing C. Ahn, and Brent Fultz, "Zeolite-Templated Carbon Materials for High Pressure Hydrogen Storage," *Langmuir* **28**, 10057 (2012). DOI: 10.1021/la302050m
240. Tian Lan, Xiaoli Tang and Brent Fultz, "Phonon anharmonicity of rutile TiO₂ studied by Raman spectrometry and molecular dynamics simulations," *Phys. Rev. B* **85**, 094305 (2012). DOI: 10.1103/PhysRevB.85.094305
241. J.A. Muñoz, M.S. Lucas, L. Mauger, J. Horwath, S.I. Semiatin, Y. Xiao, M.B. Stone, D.L. Abernathy, and B. Fultz, "Electronic structure and vibrational entropies of fcc Au-Fe alloys," *Phys. Rev. B* **87**, 014301 (2013).
242. D. Abrecht and B. Fultz, "Evaluation of the Thermodynamic Properties of H₂ Binding in Solid State Dihydrogen Complexes [M(η^2 -H₂)(CO)dppe₂][BARF²⁴] (M = Mn, Tc, Re): An Experimental and First Principles Study" *J. Phys. Chem. C* **116**, 22245 (2012).
243. Tian Lan, Chen W. Li, and Brent Fultz, "Phonon anharmonicity of rutile SnO₂ studied by Raman spectrometry and first principles calculations of the kinematics of phonon-phonon interactions" *Phys. Rev. B* **86**, 134302 (2012).
244. Justin Purewal, Brandon Keith, Channing Ahn, Craig Brown, Madhusudan Tyagi, and Brent Fultz, "Hydrogen diffusion in potassium intercalated graphite studied by quasielastic neutron scattering," *J. Chem. Phys.* **137**, 224704 (2012).
245. M.S. Lucas, L. Mauger, J.A. Munoz, I. Halevy, J. Horwath, S.L. Semiatin, S.O. Leontsev, M.B. Stone, D.L. Abernathy, Yuming Xiao, Paul Chow, and B.

- Fultz, "Phonon densities of states of face-centered-cubic Ni-Fe alloys," *J. Appl. Phys.* **113**, 17A308 (2013).
246. N.P. Stadie, M. Murialdo, C.C. Ahn, and B. Fultz, "Anomalous Isothermic Enthalpy of Adsorption of Methane on Zeolite-Templated Carbon," *J. Am. Chem. Soc.* **135**, 990 (2013).
 247. Hillary Smith, Billy Hornbuckle, Lisa Mauger, Bianzhu Fu, Sally Tracy, Gregory Thompson, Matthew Lucas, Yuming Xiao, Michael Hu, Jiyong Zhao, E. Alp, and Brent Fultz. "Changes in Vibrational Entropy During the Early Stages of Chemical Unmixing in fcc Cu-6%Fe," *Acta Materialia* **61**, 7466 (2013).
 248. M. Palumbo, B. Burton, A. Costa e Silva, B. Fultz, B. Grabowski, G. Grimvall, B. Hallstedt, O. Hellmann, B. Lindahl, A. Schneider, P.E.A. Turchi, and W. Xiong, "Thermodynamic modelling of crystalline unary phases," *Physica Status Solidi B* **251**, 14–32 (2014) / DOI 10.1002/pssb.201350133.
 249. H.J. Tan, H.L. Smith, L. Kim, T.K. Harding, S.C. Jones, and B. Fultz, "Electrochemical Cycling and Lithium Insertion in Nanostructured FeF₃ Cathodes", *J. Electrochem. Soc.* **161**, A445 (2014).
 250. Tian Lan, C.-W. Li, J.L. Niedziela, H. Smith, D.L. Abernathy, G.R. Rossman, and B. Fultz, "Anharmonic lattice dynamics of cuprite Ag₂O studied by inelastic neutron scattering and first principles molecular dynamics simulations," *Phys. Rev. B* **89**, 054306 (2014).
 251. D.G. Abrecht, J.A. Muñoz, H.L. Smith, and B. Fultz, "Spin-State Effects on the Thermal Dihydrogen Release from Solid-State [MH(eta²-H₂)dppe2]⁺ (M=Fe,Ru,Os) Organometallic Complexes for Hydrogen Storage Applications, *J. Phys. Chem. C* **118**, 1783 (2014).
 252. S.J. Tracy, L. Mauger, H.J. Tan, J.A. Muñoz, Y.M. Xiao and B. Fultz, "Polaron-ion correlations in Li_xFePO₄ studied by x-ray nuclear resonant forward scattering at elevated pressure and temperature," *Phys. Rev. B* **90**, 094303 (2014).
 253. Chen W. Li, H. Smith, T. Lan, J.A. Muñoz, J.B. Keith, L. Mauger, D. Abernathy, and B. Fultz, "Phonon anharmonicity of monoclinic zirconia and yttrium-stabilized zirconia at elevated temperatures", *Phys. Rev. B* **91**, 144302 (2015).
 254. L. Mauger, M.S. Lucas, J.A. Muñoz, S.J. Tracy, M. Kresch, Yuming Xiao, Paul Chow, and B. Fultz, "Nonharmonic Phonons in alpha-Iron at High Temperatures," *Physical Review B* **90**, 064303 (2014). see press release: <http://www.caltech.edu/news/how-iron-feels-heat-45656>
 255. F. Körmann, B. Grabowski, B. Dutta, T. Hickel, L. Mauger, B. Fultz, and J. Neugebauer "Temperature dependent magnon-phonon coupling in bcc Fe from theory and experiment," *Phys. Rev. Lett.* **113**, 165503 (2014).
 256. J.Y.Y. Lin, H.L. Smith, G.E. Granroth, D.L. Abernathy, M.D. Lumsden, B. Winn, A.A. Aczel, M. Aivazis, B. Fultz, "MCViNE -- An object oriented Monte

- Carlo neutron ray tracing simulation package", *Nucl. Instr. Meth. A* **810**, 86 (2016). arXiv:1504.02776.
257. Maxwell Murialdo, Nicholas P. Stadie, Channing C. Ahn, and Brent Fultz, "Observation and Investigation of Increasing Isothermic Heat of Adsorption of Ethane on Zeolite-Templated Carbon," *Journal of Physical Chemistry*, **119**, 944 (2015).
 258. D.S. Kim, H.L. Smith, J.L. Niedziela, C.W. Li, D.L. Abernathy, and B. Fultz, "Phonon Anharmonicity in Silicon from 100 to 1500 K," *Phys. Rev. B* **91**, 014307 (2015).
 259. Tian Lan, C.W. Li, O. Hellman, J. A. Muñoz, H. Smith, D.L. Abernathy, and B. Fultz, "Phonon quarticity induced by changes in phonon-tracked hybridization during lattice expansion, and its stabilization of rutile TiO₂", *Phys. Rev. B*, **92**, 054304 (2015).
 260. M. Murialdo, N. Stadie, Nicholas, C.C. Ahn and B. Fultz, "Krypton Adsorption on Zeolite-Templated Carbon and Anomalous Surface Thermodynamics", *Langmuir*, **31**, 7991 (2015).
 261. Elahe Talaie, Victor Duffort, Hillary L. Smith, Brent Fultz, and Linda F. Nazar, "Structure of the High Voltage Phase of Layered P2-Na_x[Mn_{1/2}Fe_{1/2}]O₂ and the Positive Effect of Ni Substitution on its Stability," *Energy & Environmental Science* **8**, 2512 (2015). DOI: 10.1039/C5EE01365H.
 262. Nicholas P. Stadie, Maxwell Murialdo, Channing C. Ahn, and Brent Fultz, "Unusual Entropy of Adsorbed Methane on Zeolite-Templated Carbon," *J. Phys. Chem. C* **119**, 26409 (2015).
 263. S.J. Tracy, L. Mauger, H.L. Smith, H.J. Tan, J.E. Herriman, Y.M. Xiao and B. Fultz, "Polaron mobility and disordering of the sodium sublattice in triphylite-Na_xFePO₄," *Chemistry of Materials* **28**, 3051 (2016).
 264. L. Mauger, J. E. Herriman, O. Hellman, S. J. Tracy, M.S. Lucas, J.A. Muñoz, Yuming Xiao, J. Li and B. Fultz, Phonons and Elasticity of Cementite through the Curie Temperature, *Phys. Rev. B* **95**, 024308 (2017).
 265. M. Murialdo, N.P. Stadie, C.C. Ahn, and B. Fultz, "A Generalized Law of Corresponding States for the Physisorption of Classical Gases with Adsorbate-Adsorbate Interactions," *J. Phys. Chem. C* **120**, 11847 (2016).
 266. F.C. Yang, J.A. Muñoz, O. Hellman, L. Mauger, M.S. Lucas, S.J. Tracy, M.B. Stone, D.L. Abernathy, Y-M. Xiao and B. Fultz, "Thermally Driven Electronic Topological Transition in FeTi," *Phys. Rev. Lett.* **117**, 076402 (2016).
 267. Yang Shen, Chen W. Li, Xiaoli Tang, Hillary L. Smith, and B. Fultz, "Phonon Anharmonicity and Components of the Entropy in Palladium and Platinum," *Phys. Rev. B* **93**, 241303 (2016).
 268. Xiao Tong, Xiaolin Xu, B. Fultz, Haidong Zhang, Timothy A. Strobel and Duck Young Kim, "Phonons in Si₂₄ at simultaneously elevated temperature and pressure," *Phys. Rev. B* **95**, 094306 (2017).

269. H.L. Smith, C.W. Li, A. Hoff, G. Garrett, D.S. Kim, F.C. Yang, M.S. Lucas, T. Swan-Wood, J.Y.Y. Lin, M.B. Stone, D.L. Abernathy, M. Demetriou, and B. Fultz, "Separating the Configurational and Vibrational Entropy Contributions in Metallic Glasses," *Nature Physics* **13**, 900 (2017).
270. M. Murialdo, C.C. Ahn, and B. Fultz, "A Thermodynamic Investigation of Adsorbate-Adsorbate Interactions of Carbon Dioxide on Nanostructured Carbons," *AIChE Journal* **64**, 1026 (2018).
271. D.S. Kim, O. Hellman, J. Herriman, H.L. Smith, J.Y.Y. Lin, N. Shulumba, J.L. Niedziela, C.W. Li, D.L. Abernathy, and B. Fultz, "Nuclear quantum effect with pure anharmonicity and the anomalous thermal expansion of silicon," *Proc. Nat'l Acad. Sciences* **115**, 1992 (2018).
- See also: C. Ash and J. Smith, "In Other Journals," *Science*, **360**, 167 (2018).
272. Heng Yang, Nicholas J. Weadock, Hongjin Tan, and Brent Fultz, "High capacity V-based metal hydride electrodes for rechargeable batteries," *Journal of Materials Chemistry A* **5**, 21785 (2017).
273. F.C. Yang, O. Hellman, M. S. Lucas, H.L. Smith, C.N. Saunders, Yuming Xiao, Paul Chow, and B. Fultz, "The temperature dependence of phonons in Pd₃Fe through the Curie temperature," *Phys. Rev. B* **98**, 024301 (2018).
274. Hillary L. Smith*, Yang Shen*, Dennis S. Kim, Fred C. Yang, C.P. Adams, Chen W. Li, D.L. Abernathy, M.B. Stone, and B. Fultz, "The temperature dependence of phonons in FeGe₂," *Phys. Rev. Mater.* **2**, 103602 (2018).
275. Jane E. Herriman, Olle Hellman, and Brent Fultz, "Phonon thermodynamics of GaN at high temperatures and pressures," *Phys. Rev. B* **98**, 214105 (2018).
276. Maxwell Murialdo, Nicholas J. Weadock, Yiqun Liu, Channing C. Ahn, Sarah E. Baker, Kai Landskron, Brent Fultz, "High-Pressure Hydrogen Adsorption on a Porous Electron-Rich Covalent Organonitridic Framework," *ACS Omega* **4**, 444 (2019).
277. K.E. Hurst, T. Gennett, J. Adams, M.D. Allendorf, R. Balderas-Xicohtencatl, M. Bielewski, B. Edwards, L. Espinal, B. Fultz, M. Hirscher, M.S.L. Hudson, Z. Hulvey, M. Latroche, D.J. Liu, M. Kapelewski, E. Napolitano, Z.T. Perry, J. Purewal, V. Stayila, M. Veenstra, J.L. White, Y.P. Yuan, H.C. Zhou, C. Zlotea, P. Parilla, "An International Laboratory Comparison Study of Volumetric and Gravimetric Hydrogen Adsorption Measurements," *CHEMPHYSICHEM* **20**, 1997 (2019).
278. David Wendt, Emil Bozin, Joerg Neuefeind, Katharine Page, Wei Ku, Limin Wang, Brent Fultz, Alexey V. Tkachenko, and Igor A. Zaliznyak "Entropic elasticity and negative thermal expansion in a simple cubic crystal," *Sci Adv.* **5**, eaay2748 (2019).
279. Fred C-R. Yang, O. Hellman, and B. Fultz, "Temperature dependence of electron-phonon interactions in vanadium," *Phys. Rev. B*, **101**, 094305 (2020). DOI: 10.1103/PhysRevB.101.094305.

280. S.H. Lohaus, M.B. Johnson, P.F. Ahn, C.N. Saunders, H.L. Smith, M.A. White and B. Fultz, "Thermodynamic stability and contributions to the Gibbs free energy of nanocrystalline Ni₃Fe," *Phys. Rev. Mater* **4**, 086002 (2020).
281. Y. Shen, C.N. Saunders, C.M. Bernal, D.L. Abernathy, M.E. Manley, B. Fultz, "The Anharmonic Origin of the Large Thermal Expansion of NaBr," *Phys. Rev. Lett.* **125**, 085504 (2020). DOI: 10.1103/PhysRevLett.125.085504.
282. J.E. Herriman and B. Fultz, "Phonon thermodynamics and elastic behavior of GaAs at high temperatures and pressures," *Phys. Rev. B* **101**, 214108 (2020). DOI: 10.1103/PhysRevB.101.214108
283. D.S. Kim, O. Hellman, N. Shulumba, C.N. Saunders, J.Y.Y. Lin, H.L. Smith, J.E. Herriman, J.L. Niedziela, D.L. Abernathy, C.W. Li, and B. Fultz, "Temperature-dependent phonon lifetimes and thermal conductivity of silicon by inelastic neutron scattering and ab initio calculations," *Phys. Rev. B* **102**, 174311 (2020).
284. Y. Shen, C.N. Saunders, C.M. Bernal, D.L. Abernathy, M.E. Manley, and B. Fultz, "Quantum anharmonicity and intermodulation phonon sidebands in NaBr," *Phys. Rev. B* **103**, 134302 (2021). DOI: 10.1103/PhysRevB.103.134302.
285. N.J. Weadock, P. Voorhees, and B. Fultz, "Interface pinning causes the hysteresis of the hydride transformation in Pd-H," *Phys. Rev. Mater.* **5**, 013604 (2021). DOI: 10.1103/PhysRevMaterials.5.013604
286. C.N. Saunders, D.S. Kim, O. Hellman, H.L. Smith, C.M. Bernal, N.J. Weadock, S.T. Omelchenko, G.E. Granroth, D.L. Abernathy, and B. Fultz, "Anharmonic Phonons in Cu₂O and Thermal Expansion: A Computational and Experimental Study" *Phys. Rev. B*, submitted.
287. L. Mauger*, S.H. Lohaus* and B. Fultz, "The Temperature Dependence of Nuclear Resonant X-Ray Spectra of Magnetic Iron and Cementite," *Hyperfine Interactions*, in press. (* contributed equally)
288. B.A. Abuamarah, M.K. Azer, A.M.A. Seddik, P.D. Asimow, P. Guzman, B.T. Fultz, M.J. Wilner, N. Dalleska, M.H. Darwish, "Magmatic and post-magmatic evolution of post-collisional rare-metal bearing granite: The Neoproterozoic Homrit Akarem Granitic Intrusion, south Eastern Desert of Egypt, Arabian-Nubian Shield," *Geochemistry* **82**, 125840 (2022). DOI 10.1016/j.chemer.2021.125840
289. C. Quine, H. Smith, C.C. Ahn, A. Hasse-Zamudio, D. Boyd and B. Fultz, "Hydrogen Adsorption and Isotope Mixing on Copper-Functionalized Activated Carbons," *The Journal of Physical Chemistry*, submitted.
290. Hillary L. Smith, Claire N. Saunders, Camille Bernal, Stefan H. Lohaus, Lucy K. Decker, J.Y.Y. Lin, Jennifer L. Niedziela, D.L. Abernathy, Marios D. Demetriou, B. Fultz, "Vibrational Contributions to the Excess Entropy in Ultra-fragile Metallic Glasses," *Physical Review B* (to be submitted)

291. C. M. Bernal-Choban, H. L. Smith, C. N. Saunders, D. S. Kim, L. Mauger, D. L. Abernathy, B. Fultz, "Nonharmonic contributions to the high-temperature phonon thermodynamics of Cr," *Physical Review Materials* (to be submitted)

Refereed Chapters in Society Books / Refereed Conference Proceedings

292. J. W. Morris, Jr., C. K. Syn, J. I. Kim, and B. Fultz, "Consequences of the Re-transformation of Precipitated Austenite in Ferritic Cryogenic Steels", Proc. Int'l Conf. on Martensitic Transformations, MIT Press, Cambridge, Mass. (1979) 572-578.
293. B. Fultz and J. W. Morris, Jr., "A Mössbauer Study of Microstructural and Chemical Changes in Fe-9Ni Steel during Two-Phase Tempering", in Nuclear and Electron Resonance Spectroscopies Applied to Materials Science, E. Kaufmann and G. Shenoy, eds., Elsevier North Holland (1981) 377-384.
294. B. Fultz and J. W. Morris, Jr., "The Effects of High Magnetic Fields on Martensitic Transformations and Mechanical Properties of Stainless Steels at Low Temperatures", in Proc. Int'l Cryogenic Materials Conf., Kobe, Japan, Butterworths, England (1982) 343.
295. B. Fultz, G. M. Chang, and J. W. Morris, Jr., "Effects of High Magnetic Fields on Martensitic Transformations and Mechanical Properties of Steels at Low Temperatures", in Austenitic Steels at Low Temperatures, R. P. Reed and T. Horiuchi, eds., Plenum, New York (1983) 199-209.
296. G. O. Fior, B. Fultz, and J. W. Morris, Jr., "The Effects of High Magnetic Fields on the Microstructure and Toughness of Cryogenic 9Ni Steel", in Ferritic Alloys for Nuclear Energy Technologies, J. W. Davis and D. J. Michel, eds., TMS-AIME, Warrendale, Pa. (1984) 543-548.
297. B. Fultz, G. M. Chang, R. Kopa, and J. W. Morris, Jr., "Magneto-Mechanical Effects in 304 Stainless Steel", in Adv. Cryogenic Eng. (Materials) 30, R. P. Reed and A. F. Clark, eds., Plenum, New York (1984) 253-262.
298. B. Fultz and J. W. Morris, Jr., "Hyperfine Magnetic Fields in Fe- Ni-X Alloys and their Application to a Study of Tempering of 9Ni Steel", a chapter in Industrial Applications of the Mössbauer Effect, G. Long and J. Stevens, eds., Plenum, New York (1986) 237-266.
299. B. Fultz, G. O. Fior, G. M. Chang, and J. W. Morris, Jr., "Magneto-Mechanical Effects in Two Steels with Metastable Austenite", Adv. Cryogenic Eng. (Materials) 32, R. P. Reed and A. F. Clark, eds., Plenum, New York (1986) 377-384.
300. B. Fultz and J. W. Morris, Jr., "The Stability of Austenite Precipitated During the Intercritical Tempering of Cryogenic 9Ni Steel", Proc. Int'l Conf. on Martensitic Transformations, Nara, Japan, 1986, Japan Inst. of Metals, I. Tamura, ed. (1987) 412-426.
301. B. Fultz and L. Anthony, "Suppression of Vacancy Diffusion During Short Range Ordering", in Diffusion in High Technology Materials 1988, D. Gupta, A. D.

- Romig, Jr. and M. A. Dayananda, eds., Trans Tech, Aedermannsdorf, Switzerland, (1988) 253-260.
302. C. W. Nieh, F. Xiong, C.C. Ahn, Z. Zhou, D. N. Jamieson, T. Vreeland, Jr., B. Fultz, and T. A. Tombrello, "Formation of Buried Oxide in MeV Oxygen Implanted Silicon", *Mat. Res. Soc. Symp. Proc.* 107 (1988) 73-78.
 303. C. C. Ahn, D. H. Pearson, and B. Fultz, "Charge Transfer in Binary Alloys – A Future for Electron Energy Loss Spectroscopy in Materials Science", G. W. Bailey, ed., *Proc. 46th Annual Mtg. of the Electron Microscopy Society of America* (San Francisco Press, 1988) 2-5.
 304. C. C. Ahn, D. H. Pearson, P. Rez and B. Fultz, "EELS White Line Intensities Calculated for the 3d and 4d Metals", *Proceedings of the 47th Annual Meeting of the Electron Microscopy Society of America*, G. W. Bailey, ed. (San Francisco Press, 1989) 388-389.
 305. J. Okamoto, C. Ahn, and B. Fultz, "Temperature-Dependent EXELFS of Chemically Ordered and Disordered Fe₃Al", L. D. Peachey and D. B. Williams, eds. *Proceedings of the XIIth International Congress for Electron Microscopy*, (San Francisco Press, 1990) 50-51.
 306. D. H. Pearson, C. C. Ahn, B. Fultz, and P. Rez, "Hartree-Slater Calculations of the L₂₃ Edges of 3d Transition Metal Electron Energy Loss Spectra", L. D. Peachey and D. B. Williams, eds. *Proceedings of the XIIth International Congress for Electron Microscopy*, (San Francisco Press, 1990) 58-59.
 307. L. Anthony and B. Fultz, "Kinetics of B₂ and D₀₃ Ordering: Theory", in *Mater. Res. Soc. Symp. Proc. 186, Alloy Phase Stability and Design*, G. M. Stocks, D. P. Pope, and A. F. Giamei, eds. (Materials Research Society, 1991) 181-186.
 308. B. Fultz, Z-Q. Gao, and L. Anthony, "Kinetics of Ordering in Fe₃Al: Experiment", in *Mater. Res. Soc. Symp. Proc. 186, Alloy Phase Stability and Design*, G. M. Stocks, D. P. Pope, and A. F. Giamei, eds. (Materials Research Society, 1991) 186-192.
 309. J. Okamoto, C. Ahn, and B. Fultz, "Temperature-Dependent EXELFS of Al K and Fe L_{2,3} Edges in Chemically Disordered and D₀₃ Ordered Fe₃Al", in *Microbeam Analysis – 1990*, J. R. Michael and P. Ingram, eds. (San Francisco Press, 1990) 56-58.
 310. R. Kikuchi, T. Mohri, and B. Fultz, "The Pseudostable Phase", *Materials Research Society Symposium Proceedings Vol. 205* (MRS, 1992) 387-392.
 311. J. K. Okamoto, C. C. Ahn, and B. Fultz, "EXELFS Analysis of Al K, Fe L₂₃, and Pd M₄₅ Edges", in *Microbeam Analysis – 1991*, D. G. Howitt, ed. (San Francisco Press, 1991) 273-277.
 312. B. Fultz, "Kinetic States of Order in Highly Nonequilibrium Materials", in *Ordering and Disordering in Alloys*, A. R. Yavari, ed., (Elsevier, London, 1992) 31-42.

313. J. Okamoto, D. H. Pearson, C. C. Ahn, and B. Fultz, "EELS Analysis of the Electronic Structure and Microstructure of Metals", Chapter 8 in Transmission Electron Energy Loss Spectrometry in Materials Science, TMS EMPMD Monograph Series Vol. 2, M. Disko, C. C. Ahn, and B. Fultz, eds., (TMS, Warrendale, 1992) 183-216.
314. Z. Q. Gao and B. Fultz, "Transient B32-Like Order in Nonequilibrium Fe₃Al" in Kinetics of Ordering Transformations in Metals, H. Chen and V. K. Vasudevan, eds. (TMS, Warrendale, 1992) 151-159.
315. T. A. Stephens, H. Kuwano, and B. Fultz, "Site Occupancies of Ternary Solutes in FeCo-X (X=Mo,W)", in Kinetics of Ordering Transformations in Metals, H. Chen and V. K. Vasudevan, eds. (TMS, Warrendale, 1992) 53-59.
316. B. Fultz, "Effects of Vacancy-Solute Interactions on the Kinetics of Ordering" in Kinetics of Ordering Transformations in Metals, H. Chen and V. K. Vasudevan, eds. (TMS, Warrendale, 1992) 121-130.
317. H. Ouyang, B. Fultz, and H. Kuwano, "Grain Boundary Widths of Four fcc and bcc Nanophase Alloys Prepared by Mechanical Attrition", in Nanophases and Nanocrystalline Structures, R. D. Shull and J. M. Sanchez, eds., (TMS, Warrendale, 1994) 95-104.
318. C. C. Ahn, L. Hong, J. Eckert, B. Fultz, and W. L. Johnson, "Energy Filtered Imaging of Nanophase Materials", Proc. Annual Mtg. of the Electron Microscopy Society of America (San Francisco Press, 1992) G. W. Bailey, ed. 1196-1197.
319. B. Fultz, "Kinetics of Disorder → Order Transformations: Thermodynamic Theory Versus Kinetic Rate Theory", in Statics and Dynamics of Alloy Phase Transformations, P. E. A. Turchi and A. Gonis, eds., (Plenum, New York, 1994) 669-672.
320. T. F. Lindsey and B. Fultz, "Monte Carlo Simulations of Ordering Kinetics", in B. Fultz, R. W. Cahn, and D. Gupta, eds., Diffusion in Ordered Alloys, TMS EMPMD Monograph Series Vol. 3 (TMS, Warrendale, 1993) 91-106.
321. L. Anthony and B. Fultz, "CVM-Based Free Energy Estimates in Monte Carlo Simulations", in B. Fultz, R. W. Cahn, and D. Gupta, eds., Diffusion in Ordered Alloys, TMS EMPMD Monograph Series Vol. 3 (TMS, Warrendale, 1993) 107-114.
322. B. Fultz, L. Anthony, and Z.-Q. Gao, "Kinetics of Ordering in Alloys Far from Thermodynamic Equilibrium" in Solid-Solid Phase Transformations, W. C. Johnson, J. Howe, D. E. Laughlin, and W. A. Soffa, eds. (TMS, Warrendale, 1994) 1007- 1025.
323. L. Anthony, L. J. Nagel, and B. Fultz, "Vibrational Entropy Differences in Intermetallic Compounds from Phonon Densities of States" in Solid-Solid Phase Transformations, W. C. Johnson, J. Howe, D. E. Laughlin, and W. A. Soffa, eds. (TMS, Warrendale, 1994) 467-472.

324. C. C. Ahn, S. Karns, C. M. Garland, H. A. Atwater, and B. Fultz, "P-20 Phosphor on Polyamide as a Large Area High Resolution Transmission Screen for Slow Scan CCD Systems", submitted to Proc. Annual Mtg. of the Electron Microscopy Society of America (San Francisco Press, 1992) G. W. Bailey, ed.
325. B. V. Ratnakumar, S. Surampudi, S. Di Stefano, G. Halpert, C. Witham, A. Hightower, and B. Fultz, "Studies on AB₅ Metal Hydride Alloys with Sn Additives", Hydrogen and Metal Hydride Batteries, P. D. Bennett and T. Sakai, eds., The Electrochemical Society Battery Division Proc. 94-27 (1994) 57- 67.
326. C. K. Witham, B. Fultz, B. V. Ratnakumar, and R. C. Bowman, Jr., "Microstructural Effects of Hydrogen Charging and Discharging on LaNi_{5-x}Sn_x", Hydrogen and Metal Hydride Batteries, P. D. Bennett and T. Sakai, eds., The Electrochemical Society Battery Division Proc. 94-27 (1994) 68-77.
327. B. Fultz, L. B. Hong, Z. Q. Gao and C. Bansal, "Two Strategies for Designing Nanocrystalline Alloys with Stability Against Grain Growth", in Synthesis and Processing of Nanocrystalline Powder, D. L. Bourell, ed., TMS, Warrendale, (1996) 249-262.
328. L. B. Hong and B. Fultz, "Two-Phase Coexistence in Fe-Ni Alloys Prepared by Mechanical Alloying", in Processing and Properties of Nanocrystalline Materials, C. Suryanarayana, J. Singh, and F. H. Froes, eds., (TMS, Warrendale, PA, 1996). pp. 221-232.
329. B. Fultz and L. Anthony, "The Thermal Stability of Alloys having Periodic Minimal Surface Microstructures", in Mathematics of Microstructure Evolution, L.Q. Chen, B. Fultz, J. W. Cahn, J. R. Manning, J. E. Morral and J. Simmons, eds., joint publication of (TMS, Warrendale, PA, 1996) TMS ISBN No. 0-87339-351-1 and (SIAM, Philadelphia, PA, 1996) SIAM ISBN No. 0-89871-386-2. pp. 39-48.
330. B.V. Ratnakumar, S. Surampudi, B. Fultz, C. Witham, R.C. Bowman, Jr., and A. Hightower, "LaNi_{5-x}Sn_x Electrodes for Ni/MH Electrochemical Cells," *NASA Tech Briefs* August 1998, p. 60-61.
331. B.V. Ratnakumar, C. Witham, B. Fultz, , S. Surampudi, R.C. Bowman, Jr., and A. Hightower, "LaNi_{5-x}Ge_x Electrodes for Ni/MH Electrochemical Cells," *NASA Tech Briefs* August 1998, p. 61-63.
332. H. N. Frase, L. J. Nagel, J. L. Robertson, and B. Fultz, "Vibrational Density of States in Nanocrystalline Ni₃Al, Fe and Ni₃Fe", in E. Ma, B. Fultz, R. Shull, J. Morral, and P Nash, eds., Chemistry and Physics of Nanostructures and Related Non-Equilibrium Materials, (TMS, Warrendale, PA, 1997), ISBN No. 0-87339-358-8. pp. 125-134.
333. B. V. Ratnakumar, A. Hightower, C. Witham, R. C. Bowman, and B. Fultz, "Kinetics of Hydrogen Diffusion in LaNi_{5-x}Sn_x Alloys", in Electrochemical Society Proceedings Vol. 96-17, P. D. Bennett and S. Gross, eds. (The Electrochemical Society, Pennington, NJ, 1997) p. 197 - 208.

334. J. A. Dooley, C. A. Lindensmith, R. G. Chave, B. Fultz, and J. Graetz, "Cryogenic Magnetostrictive Actuators: Materials and Applications" Proceedings of ACTUATOR 98, 6th International Conference on New Actuators, Bremen, FRG, 1998.
335. J. Ting, V. K. Pecharsky, I. E. Anderson, C. Witham, R. C. Bowman, Jr., and B. Fultz, "Gas Atomization Processing of $\text{LaNi}_{5-x}\text{M}_x$ Modified with Silicon and Tin", Hydrogen in Semiconductors and Metals, MRS Symposium Proceedings 513, N. H. Nickel, W. B. Jackson, R. C. Bowman, Jr., and R. Leisure, eds. (Materials Research Society, 1998) 305-310.
336. J. Dooley, N. R. Good, J. Graetz, R. Chave and B. Fultz, "Magnetostriction of Polycrystalline Tb-Dy at Cryogenic Temperatures", Adv. Cryogenic Eng. (Materials), 46(a), pp. 383-389, 1999.
337. B. Fultz and H. N. Frase, "Grain Boundaries of Nanocrystalline Materials", in Ultrafine Grained Materials, R. S. Mishra, S. L. Semiatin, C. Suryanarayana N. N. Thadhani, and T. C. Lowe, eds., (TMS, Warrendale PA, 2000) p. 3-12.
338. B. Fultz, W. Sturhahn, T. S. Toellner, and E. E. Alp, "An Inelastic Nuclear Resonant Scattering Study of Partial Entropies of Ordered and Disordered Fe_3Al ", in MRS Symposium Proceedings 590, Applications of Synchrotron Radiation Techniques to Materials Science V, S. R. Stock, S. M. Mini, and D. L. Perry, eds. (Materials Research Society, Warrendale, PA 2000) pp. 91-102.
339. R. Chave, C. Lindensmith, J. Dooley, B. Fultz, and M. Birsan, "Polycrystalline Tb/Dy Alloy for Magnetostrictive Actuators", NASA Tech Briefs 23 (8) (1999) p. 44.
340. R. Chave, J. Dooley, B. Fultz, and M. Birsan, "Extruding Tb/Dy for Magnetostrictive Actuators", NASA Tech Briefs 23 (8) (1999) p. 44.
341. R. Chave, C. Lindensmith, J. Dooley, B. Fultz, and M. Birsan, "Push/Pull Magnetostrictive Linear Actuator", NASA Tech Briefs 23 (8) (1999) p. 47.
342. R. Chave, C. Lindensmith, B. Fultz, and M. Birsan, "Magnetostrictive Heat Switch for Cryogenic Use", NASA Tech Briefs 23 (8) (1999) p. 48-49.
343. B.V. Ratnakumar, R. C. Bowman, A. Hightower, C. Witham, and B. Fultz, "LaNi_{5-x}M_x Alloys for Ni/Metal Hydride Electrochemical Cells," *NASA Tech Briefs* May 1999, p. 48.
344. A. Hightower, C. C. Ahn and B. Fultz "Electron Energy Loss Spectrometry on Lithiated Graphite" Microbeam Analysis 2000; Institute of Physics Conference Series 165 (2000) pp. 225-226.
345. J. Graetz, R. Yazami, C. C. Ahn, P. Rez, and B. Fultz, "Electronic Structure of Oxygen in Delithiated LiTMO_2 Studied by Electron Energy-Loss Spectrometry", Proceedings of NATO-ASI New Trends in Intercalation Compounds for Energy Storage 2001, edited by C. Julien (Kluwer Press, 2002), p. 469.

346. J. Graetz, A. Hightower, C. C. Ahn, P. Rez, and B. Fultz "Electronic structure analysis of LiCoO₂ using electron energy loss spectroscopy (EELS)", Microscopy and Microanalysis Proceedings 2001 Vol. 7, edited by G. W. Bailey, R. L. Price, E. Voelkl, and I. H. Musselman (Springer, 2001) p. 1186-1187.
347. H. Gabrisch, R. Yazami, and B. Fultz, "Lattice Defects in LiCoO₂", Microscopy and Microanalysis Proceedings 2001 Vol. 7, edited by G. W. Bailey, R. L. Price, E. Voelkl, and I. H. Musselman (Springer, 2001) p. 518-519.
348. J. Dooley, B. Fultz, J. Voccio, and R. Chave, "Magnetoelastic Vibration Dampers", NASA Tech Briefs 25(12), Dec. 2001 p. 56-57.
349. J. Dooley, R. Chave, B. Fultz, A. Clark, N. Good, J. Graetz, "Progress in Magnetoelastic Vibration Dampers", NASA Tech Briefs 25(12), Dec. 2001 p. 57.
350. C. C. Ahn, J. J. Vajo, B. Fultz, R. Yazami, and D. W. Brown, "Etude par diffraction de neutrons de l'insertion du deutérium dans les composés graphite-potassium de stades 2, 3 et 4", submitted to GFEC, Lans-en-Vercors, 25-28 Mars 2002.
351. B. Fultz and J.Y.Y. Lin "Mössbauer Diffractometry: Concepts, Instrumentation and Measurements," in Materials Research in Atomic Scale by Mössbauer Spectroscopy, Miroslav Maslan, Marcel Miglierini, and Peter Schaaf, editors, NATO Advanced Research Workshop Series II. Mathematics, Physics and Chemistry – Vol 94 (Kluwer, Dordrecht, 2003) p. 285-295.
352. H. Gabrisch, R. Yazami, and B. Fultz, "A Transmission Electron Microscopy Study of Cycled LiCoO₂", 11th International Meeting on Lithium Batteries, Monterey, CA, 2002, ed. F. McLarnon (Elsevier, J. Power Sources, (2003), p. 674.
353. H. Gabrisch, R. Yazami, and B. Fultz, "Phase Transformations in LiCoO₂ ", in Proceedings of the Electrochemical Society Meeting at Salt Lake City, Utah, 2002 (The Electrochemical Society, Pennington, NJ, 2002).
354. Y. Ozawa, R. Yazami, and B. Fultz, "Ageing Kinetics of the LiCoO₂ Positive Electrode", in Proceedings of the Electrochemical Society Meeting at Salt Lake City, Utah, 2002 (The Electrochemical Society, Pennington, NJ, 2002).
355. O. Delaire, M. Kresch, and B. Fultz "Vibrational Entropy of the gamma-alpha Martensite Transformation in Fe₇₉Ni₂₉" in Solid-Solid Phase Transformations in Inorganic Materials James Howe, David Laughlin, Jong Lee, David Srolovitz, Ulrich Dahmen, Richard Sisson, William Soffa, C. E. Carpenter, Eds. (TMS, Warrendale PA, 2005) p. 75-80.
356. O. Delaire, T. Swan-Wood, and B. Fultz "Vibrational Thermodynamics of Vanadium and Dilute Vanadium Alloys" in Solid-Solid Phase Transformations in Inorganic Materials ,James Howe, David Laughlin, Jong Lee, David Srolovitz, Ulrich Dahmen, Richard Sisson, William Soffa, C. E. Carpenter, Eds. (TMS, Warrendale PA, 2005) p. 359-374.

357. R. Yazami, Y. Reynier and B. Fultz, "Entropymetry of Lithium Intercalation in Spinel Manganese Oxide: Effect of Lithium Stoichiometry", *Electrochemical Society Transactions*, submitted.
358. J. L. Dodd, R. Yazami, and B. Fultz, "Determining the Phase Diagram of Li_xFePO_4 ", *Electrochemical Society Transactions*, submitted.
359. J. Dodd, A. Ait Salah, A. Mauger, F. Gendron, B. Fultz, R. Yazami, C.M. Julien "The electronic properties of chemically delithiated Li_xFePO_4 ", *Electrochemical Society Transactions*, submitted.
360. B. Fultz "Materials Science Applications of Inelastic Neutron Scattering", *JOM*, 58 (3): 58-63 Mar. 2006.
361. Y. Reynier, R. Yazami, B. Fultz and I. Barsukov, "Evolution of thermodynamic properties upon degree of graphitization in carbons" proceedings of the IBA-HBC 2006, Waikoloa, Hawaii, 2006.
362. R.I. Barabash, X.-L. Wang, J. Tiley, P.K. Liaw, B. Fultz, "Foreword: Special Topic on "Neutron and X-Ray Diffraction Studies of Advanced Materials IV" *Metall. Mater. Trans. A* **43**, 1410-1412 (2012).
363. R.I. Barabash, X.-L. Wang, G. Korstorz, B. Fultz, L. Levine, P.K. Liaw, "Neutron and X-Ray Studies of Advanced Materials V-Diffraction Centennial" , *Metall. Mater. Trans. A* **44**, 15-16 (2013).
346. R.I. Barabash, G. Kostorz, B. Fultz and P.K. Liaw, "Neutron and X-ray Studies of Advanced Materials VI: Diffraction Centennial and Beyond Foreword," *Metall. Mater. Trans. A* **45**, 72-74 (2014).
365. Jorge A. Muñoz and Brent Fultz, "Miscibility gap and phonon thermodynamics of Fe-Au alloys studied by inelastic neutron scattering and nuclear-resonant inelastic x-ray scattering," *RADIATION PHYSICS: XI International Symposium on Radiation Physics*, AIP Conference Proceedings **1671**, 020001 (2015); doi: 10.1063/1.4927178.

Non-Refereed Papers and Reports:

366. with M. A. Green et al., "Ground Plane Insulation Failure in the First TPC Superconducting Coil", *Proc. 7th Int'l Conf. on Magnet Tech., Karlsruhe, FRG*, April, 1981.
367. B. Fultz, G. O. Fior and J. W. Morris, Jr., "Effects of 18T Magnetic Fields on the Mechanical Deformation of Steels with Metastable Austenite", *Annual Report of Francis Bitter National Magnet Laboratory*, 1985.
368. B. Fultz and J. W. Morris, Jr., "Software Feedback Control for Materials Testing Systems", *J. Metals* **38** (April, 1986) 58.
369. B. Fultz, "Nonequilibrium Materials with Nanophase Microstructures", Jacob Wallenberg Foundation Award paper, Dec., 1990.

370. P. Matteazzi, G. LeCaër, and B. Fultz, "Stannides and Amorphous Phase Formation During the Mechanical Alloying of Fe and Sn Powders", Proceedings of the 2nd European Conference on Advanced Materials and Processing, Univ. of Cambridge, UK, July 22-24, 1991, T. W. Clyne and P. J. Withers, eds., (Institute of Materials, London) 388-397.
371. B. Fultz, "An Example of a Pseudostable State", in Pseudostable Phases, Final Report of NEDO Project, May, 1993, 14-29.
372. B. Fultz, "Thermodynamic Stability of Nanophase Materials", in Pseudostable Phases, Final Report of NEDO Project, May, 1993, 160-167.
373. C. K. Witham, B. Fultz, B. V. Ratnakumar, and R. C. Bowman, "Microstructural Effects of Electrochemical Charging and Discharging on $\text{LaNi}_{5-x}\text{Sn}_x$ ", extended abstract for the Battery Division, The Electrochemical Society, Fall meeting 1994, 58-59.
374. B. V. Ratnakumar, S. Surampudi, S. di Stefano, G. Halpert, C. Witham, and B. Fultz, "Studies on AB_5 Metal Hydride Alloys with Sn Additives", extended abstract for the Battery Division, The Electrochemical Society, Fall meeting 1994, 56-57.
375. C. K. Witham, R. C. Bowman, Jr., B. V. Ratnakumar, B. Fultz, and S. Surampudi, " AB_5 Metal Hydride Alloys for Alkaline Rechargeable Cells", in Proc. 11th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 1996 (Inst. Electrical Electronic Eng., Piscataway, NJ, 1996 catalog number 96TH8133), pp. 129-134.
376. B. Fultz and S. L. Cooper, "Nanocrystalline Materials for Absorbing Microwave and Infrared Radiation", Defense Science Study Group IV: Study Reports 1994-1995, W. J. Hurley and N. P. Licato, eds., IDA Paper P-3296 (Institute for Defense Analyses, Alexandria, VA).
377. C. K. Witham, R. C. Bowman, Jr., B. Fultz and B. V. Ratnakumar "Investigation of $\text{LaNi}_{5-x}\text{Ge}_x$ Alloys as Electrodes for Ni-MH Batteries", extended abstract for the Battery Division, The Electrochemical Society, Spring Meeting, Los Angeles, 1996.
378. B. V. Ratnakumar, S. Surampudi, C. Witham, A. Hightower, R. C. Bowman, and B. Fultz, "Cyclic Lifetimes of $\text{LaNi}_{5-x}\text{M}_x$ Alloys in Ni-MH Cells", in Proc. 1996 Power Sources Conf., Cherry Hill, NJ, (Submitted).
379. T. Gold, D. Latham, et al., "Tactics and Technology for 21st Century Military Superiority", Report from the Defense Science Board Summer Study Task Force for the Office of the Secretary of Defense Oct. 1996 (OSD No. 96S-4638).
380. C. K. Witham, A. Hightower, R. C. Bowman, Jr., B. V. Ratnakumar, and B. Fultz, " $\text{LaNi}_{5-x}\text{M}_x$ Metal Hydride Alloys for Alkaline Rechargeable Cells", in Proc. 12th Annual Battery Conference on Applications and Devices, Long Beach,

- CA, January, 1997 (Inst. Electrical Electronic Eng's., Piscataway, NJ, 1997 catalog number 97TH8226), pp. 323-325.
380. A. Hightower, C. K. Witham, R. C. Bowman, Jr., B. V. Ratnakumar, B. Fultz, B. Czajkowski, L. Zhang, D. Singh, M. Klein and L. Huston "Performance of $\text{LaNi}_{4.7}\text{Sn}_{0.3}$ Metal Hydride Electrodes in Sealed Cells", in Proc. 13th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 1998 H. Frank and E. Sao, eds. (Inst. Electrical Electronic Eng's., Piscataway, NJ, 1998 catalog number 98TH8299) p. 399-404.
 382. T.E. Mason, C. Broholm, B. Fultz, R. Osborn, R.A. Robinson, G. Aeppli, H.A. Mook, S.E. Nagler, B. Keimer and S. Kern, "HELIOS: A High Intensity Chopper Spectrometer at LANSCE", ICANES '98 Conference Proceedings.
 383. C. C. Ahn, Y. Ye, B. V. Ratnakumar, C. Witham, R. C. Bowman, Jr., and B. Fultz, "Carbon as a High Capacity Solid State Storage Medium for Hydrogen", Proc. 14th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 1999, H. A. Frank and E. T. Seo, eds., (Inst. Electrical Electronic Eng's., Piscataway, NJ) IEEE 99TH8371, p. 67-71.
 384. C. K. Witham, A. Hightower, B. V. Ratnakumar, R. C. Bowman, Jr., and B. Fultz, "LaNi_{5-x}M_x Alloys in Rechargeable Batteries: Factors affecting Cycle Lifetimes", Proc. 14th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 1999, H. A. Frank and E. T. Seo, eds., (Inst. Electrical Electronic Eng's., Piscataway, NJ) IEEE 99TH8371, p. 61-65.
 385. A. Hightower, J. Graetz, C. C. Ahn, B. Fultz and P. Rez, "The Valence of Li in Graphite", submitted to the Proceedings of the Electrochemical Society Annual Meeting, Phoenix, 2000.
 386. C. C. Ahn, Y. Ye, B. Fultz, J. J. Vajo, and J. J. Zinck, "Hydrogen Storage in Single Walled Carbon Nanotubes", Proceedings of the 10th Canadian Hydrogen Conference, T. K. Bose and P. Bernard, Eds., (Canadian Hydrogen Association, Quebec, 2000) ISBN 0-9696869-5-1, pp. 392-399.
 387. H. Gabrisch, R. Yazami, and B. Fultz, "Electron Diffraction and X-Ray Studies of New LiC₁₀ and LiC₈ Structures in Chemically Lithiated Single Wall Carbon Nanotubes," Proceedings of the 200th Meeting of The Electrochemical Society, San Francisco, Oct., 2001.
 388. J. Graetz, A. Hightower, C. C. Ahn, R. Yazami, P. Rez, and B. Fultz, "Electron Energy-Loss Spectrometry and Mapping of Oxygen in Delithiated LiCoO₂", Proceedings of the 200th Meeting of The Electrochemical Society, San Francisco, Oct., 2001.
 389. M. E. Manley, B. Fultz, R. J. McQueeney, W. L. Huls, J. L. Smith, D. J. Thoma, C. M. Brown, R. Osborn, and J. L. Robertson, "The Nature of Vibrational Softening in α -Uranium", Materials Science and Engineering Laboratory, FY2001 Programs and Accomplishments, NIST Center for Neutron Research, Sept. 2001. NISTIR 6798.

390. Yvan Reynier, Brent Fultz and Rachid Yazami, "Thermodynamics and kinetics of self-discharge in graphite-lithium electrodes" Proc. 17th Annual Battery Conference on Applications and Devices, Long Beach, CA, January, 2002, E. T. Seo, ed., (Inst. Electrical Electronic Eng., Piscataway, NJ). IEEE 02TH8576 p. 145.
391. Brent Fultz and Doug Abernathy, "ARCS: A High-Resolution Direct-Geometry Chopper Spectrometer at the SNS" The Neutron Pulse 2 (2) p. 6-7 (Spallation Neutron Source User Administration Office, Oak Ridge, TN, 2001).
392. R. Yazami, Y. Ozawa, H. Gabrisch, and B. Fultz, "High Voltage Aging of LiCoO_2 ", Proceedings of the 203rd Meeting of The Electrochemical Society, Paris, France, May, 2003.
393. H. Gabrisch, R. Yazami, and B. Fultz, "Reversible and Irreversible Phase Transformations in LiCoO_2 ", Proceedings of the 203rd Meeting of The Electrochemical Society, Paris, France, May, 2003.
394. R. Yazami, Y. Ozawa and B. Fultz, "Chemical self-discharge in the lithium cobalt oxide cathode", Proceedings of the 203rd Meeting of The Electrochemical Society, Paris, France, May, 2003.
395. Y. Ozawa, R. Yazami and B. Fultz, "Self-discharge mechanisms in delithiated cobalt oxide ", Proceedings of the 204th Meeting of The Electrochemical Society, Orlando, Florida, Sept, 2003.
396. H. Gabrisch, R. Yazami and B. Fultz, "In-Situ TEM Studies of Crystal Structure Transformations in $\text{Li}_{1-x}\text{CoO}_2$ at Elevated Temperatures", Proceedings of the 204th Meeting of The Electrochemical Society, Orlando, Florida, Sept, 2003.
397. B. Fultz, Y. Reynier, J. Graetz, T. Swan-Wood, P. Rez, "Origin of Entropy of Intercalation of Li into Li_xCoO_2 " in Advanced Materials For Energy Conversion II, Edited by D. Chandra, R. G. Bautista and L. Schlapbach (TMS Warrendale, PA, 2004) ISBN 0-87339-574-3 p. 311-316.
398. M. E. Manley, R. J. McQueeney, B. Fultz, T. Swan-Wood, O. Delaire, E. A. Goremychkin, J. C. Cooley, W. L. Hults, J. C. Lashley, R. Osborn, J. L. Smith, "The importance of high temperature electron-phonon coupling to the thermodynamic properties of $\text{Ce}_{0.9}\text{Th}_{0.1}$ and other f-electron bonded metals", Mater. Res. Soc. Symp. Proc. Vol. 802 (Materials Research Society, 2004) DD2.3.1.
399. O. Delaire, T. Kelley, T. Swan-Wood, M. Kresch, and B.T. Fultz, "Phonon Thermodynamics of Transition Metals and Alloys", LANSCE Activity Report 2005, Los Alamos National Laboratory. LA-UR-05-2861.
400. M. McKerns, J. McCorquodale, and B. Fultz, "Distributed Analysis of Neutrons Scattering Experiments on the TeraGrid", Oak Ridge National Laboratory report for requisition 3400050128-00001 (2005).
401. James R. Morris, Xun-Li Wang, and Brent Fultz, "Neutron Scattering Applied to Materials Problems," Commentary in JOM, 58 (3): MAR 2006.

402. Atsuo Yamada, Shinichi Nishimura, Hiroshi Koizumi, Ryoji Kanno, Shiro Seki, Yo Kobayashi, Hajime Miyashiro, Joanna Dodd, Rachid Yazami, and Brent Fultz, "Intermediate Phases in Li_xFePO_4 ", Mater. Res. Soc. Symp. Proc. Vol. 972 (Materials Research Society, 2007) 0972-AA13-02 p. 257.
403. V. Comello, with M.L. Winterrose, M.S. Lucas, A.F. Yue, I. Halevy, L. Mauger, J.A. Munoz, J. Hu, M. Lerche, and B. Fultz, "High-Pressure Alchemy" in APS Science 2009, Argonne National Laboratory publication ANL-10/06, ISSN 1931-5007, May 2010, p. 28-29.
404. B. Fultz, G.G. Long, and K.W. Herwig, "Computational Scattering Science 2010", workshop supported by NSF and DOE BES at Argonne National Laboratory, July 6-9, 2010.
http://www.its.caltech.edu/~matsci/Publish/CompScatWkshp_2010.html
405. B. Fultz, J.J. Rehr, and S.J.L. Billinge, "Workflows for Computational Scattering Science 2103," workshop supported by NSF at Caltech Jan 31-Feb. 2, 2013.
<http://s2i2.cacr.caltech.edu/main/wp-content/uploads/2013/11/WorkflowsWorkshop2013o.pdf>
406. J.J. Rehr, B. Fultz, S.J.L. Billinge and K. Jorissen, "Report on SIXNS Workshop III: Theoretical software, analysis tools, and software integration for scattering science," Talaris Conference Center, U. Washington Jan. 17-18, 2014. Report: http://www.feffproject.org/SIXNS/SIXNS_Workshop_III_Report_preliminary.pdf

Student Papers and Awards Supervised:

407. L. Anthony, "Kinetics of Long Range Ordering in Fe_3Al ", 1989 AIME-TMS Student Paper Award in the Materials Science category.
408. D. H. Pearson, "Measurements of White Line Intensities in 4d Transition Metals using Electron Energy Loss Spectrometry (EELS)", Proceedings of the 47th Annual Meeting of the Electron Microscopy Society of America, G. W. Bailey, ed.(San Francisco Press, 1989) 386-387.
409. Joseph Bach, "Shock Wave Consolidation of Metallic Glasses", Proceedings of the Fourth National Conference on Undergraduate Research, Schnectady, New York, April, 1990.
410. L. Anthony, "A Kinetic Path Theory of B2 and D0₃ Ordering", 1990 AIME-TMS Student Paper Award in the Materials Science category.
411. J. Okamoto, "Measurements of Short-Range Ordering in Ni_3Al ", submitted to the TMS Student Paper Competition 1991.
412. Z.Q. Gao, "X-Ray Diffraction Study of Ordering in Fe_3Al ", submitted to the TMS Student Paper Competition 1991.
413. Michael Manley, "Low Temperature Inelastic Neutron Scattering Study of Phases of Cerium", First Prize Student Poster Competition, Los Alamos Neutron Science Center (LANSCE) Users' Group Meeting, August 1998.

414. Peter Bogdanoff, "Vibrational Entropies of Cu-Au Alloys", First Prize Student Poster Competition, Los Alamos Neutron Science Center (LANSCE) Users' Group Meeting, January, 2000.
415. Michael Manley, "Vibrational Softening in α -Uranium", Los Alamos Science, Nov. 26, 2000 (LA-UR-00-4100) p. 202-207.
416. Michael Manley, Eighteenth Rosen Prize of the Los Alamos Neutron Science Users Group, Aug. 12, 2001. (Prize for best Ph.D. thesis at LANSCE, \$1,000 plus plaque.)
417. Olivier Delaire "Thermodynamics of phonons and electrons in vanadium alloys" Student Poster Prize of the American Conference on Neutron Scattering, St. Charles, IL June, 2006. (\$500 plus plaque)
418. Olivier Delaire, Twentieth Rosen Prize of the Los Alamos Neutron Science Users Group, 2008. (Prize for best Ph.D. thesis at LANSCE, \$1,000 plus plaque.)
419. Dennis S. Kim, Student Poster Prize of the American Conference on Neutron Scattering, Knoxville, TN, June 2014.
420. Hillary L. Smith, Acta Materialia Student Award. (Prize for best student paper in Acta Materialia in 2013, \$2,000)
421. Garrett E. Granroth, Ke An, Hillary L. Smith, Pamela Whitfield, Joerg C. Neufeind, Jooseop Lee, Wenduo Zhou, Vladislav N. Sedov, Peter F. Peterson, Andre Parizzi, Harley Skorpenske, Steven M. Hartman, Ashfia Huq and Douglas L. Abernathy, "Event-based processing of neutron scattering data at the Spallation Neutron Source," J. Appl. Cryst. 51, 616 (2018). (acks DOE BES)
422. D. Olds, C.N. Saunders, M. Peters, T. Proffen, J. Neufeind, K. Page, "Precise implications for real-space pair distribution function modeling of effects intrinsic to modern time-of-flight neutron diffractometers", Acta Cryst. A 74, (2018). doi.org/10.1107/S2053273318003224.
423. Camille Bernal, Outstanding Poster Award, "Non-harmonic Interactions in BCC Chromium," 2019 SSAP Symposium, Feb. 20, 2019.
424. Camille Bernal, Poster Award in Hard Matter, "High Temperature Non-Harmonic Phonons of Chromium from Inelastic Neutron Scattering and Ab initio Calculations," American Conference on Neutron Scattering July 13-16, 2020.
425. Claire Saunders, Oral Presentation Award in Materials Chemistry and Energy, "The Role of Nuclear Quantum Effects and Chemical Bonding on the Thermal Expansion in Cuprous Oxide Non-harmonic Interactions in BCC Chromium," American Conference on Neutron Scattering July 13-16, 2020.
426. Peter Gehring, Matthew Helgeson, Despina Louca, Bradley Olsen, Kate A. Ross, Nancy Ross, Claire Saunders & Yuyin Xi, The 10th American Conference on Neutron Scattering: Meeting Report, Neutron News, 32:1, pp. 2-6, DOI: 10.1080/10448632.2021.1875767

Conferences and Symposia Organized:

- B. Fultz, C. C. Ahn, and M. Disko, "Transmission Electron Energy Loss Spectroscopy in Materials Science" TMS Annual Meeting, New Orleans, Feb. 1991.
- Organizing Committee, European Workshop on Ordering and Disordering, Grenoble, France, July 10-12, 1991.
- B. Fultz, R. Cahn, D. Gupta "Diffusion in Ordered Alloys" TMS-ASM Fall Meeting, Chicago, 1992.
- Program Committee of the International Conference on the Applications of the Mössbauer Effect, 1993, Vancouver (ICAME'93).
- R. Shull, B. Fultz P. Maziasz, and C. C. Koch, "Structure and Properties of Nanophase Materials" TMS Annual Meeting, Las Vegas 1995.
- J. W. Cahn, B. Fultz, L-Q. Chen, J. Simmons, J. Morrall and J. Manning, "Mathematics of Thermodynamically-Driven Microstructural Evolution" TMS Fall Meeting, Cleveland, 1995.
- International Advisory Committee, International Conference on Diffusion in Materials, DIMAT'96, Münster, FRG.
- B. Fultz, R. Shull, E. Ma, J. Morrall, and P. Nash, "Chemistry and Physics of Nanostructures and Related Non-Equilibrium Materials", TMS Annual Meeting, Orlando, FL Feb. 9-13, 1997.
- International Advisory Committee, The International Symposium on the Industrial Applications of the Mössbauer Effect, ISIAME 2000, Virginia Beach, Virginia, August 13-18, 2000.
- Program Committee of the International Conference on the Applications of the Mössbauer Effect, 2001, Oxford, England (ICAME'01).
- B. Fultz and X-L. Wang, "Doing Science with Neutron Scattering Data" American Conference on Neutron Scattering, College Park, MD June 6-10, 2004.
- B. Fultz and M. Atzmon "Neutron Scattering in Materials Research" TMS Annual Meeting, San Francisco, CA Feb. 13-17, 2005.
- B. Fultz, "Collaborative Software Development", symposium at NOBUGS 2008 Australian Nuclear Science and Technology Organisation, Nov. 3-5, 2008.
- Xun-Li Wang and Brent Fultz "Emerging Applications of Neutron Scattering in Materials Science and Engineering" TMS Annual Meeting, San Francisco, CA, USA. Feb. 15-19 2009.
- Member, Sources, Instrumentation and Software program subcommittee for the American Conference on Neutron Scattering, Ottawa, Canada, June 26-30, 2010.

- B. Fultz, G.G. Long, K.W. Herwig, "Workshop on Computational Scattering Science", funded by NSF and DOE BES. Argonne National Laboratory, July 6-9, 2010.
- R.I. Barabash, P. K. Liaw, Jaimie Tiley, Erica Lilleodden, Y.D. Wang, Xun-Li Wang, and B. Fultz, "Neutron and X-Ray Studies of Advanced Materials IV", 2011 TMS Annual Meeting, San Diego, CA, USA
- R.I. Barabash, X.-L. Wang, G. Kosterz, L. Levine, P. K. Liaw, and B. Fultz, "Neutron and X-Ray Studies of Advanced Materials V: Centennial", 2012 TMS Annual Meeting, Orlando, FL, USA
- Brent Fultz, Simon Billinge, Houman Owhadi, John Rehr, Mark Stalzer, "Scientific Workflows for Scattering Science" Jan. 31 - Feb. 2, 2013, California Institute of Technology, Pasadena CA.
- R.I. Barabash, X.-L. Wang, J. Tiley, G. Kosterz, B. Fultz and P. K. Liaw "Neutron and X-Ray Studies of Advanced Materials VI: Centennial and Beyond", 2013 TMS Annual Meeting, San Antonio, TX, USA
- Malcolm Guthrie, Brent Fultz, Giulia Galli, Chi-Chang Kao, "Symposium DDD: Extreme Environments -- A Route to Novel Materials," Material Research Society (MRS), April 1-5 2013 in San Francisco.
- Michael Crawford, Brent Fultz, Xun-Li Wang, MRS Symposium "Neutron Scattering Studies of Advanced Materials," Fall Meeting, Dec. 1-6, 2013 in Boston, Mass.
- Local Organizing Committee, Chair, "American Conference on Neutron Scattering," Long Beach, CA, July 10-14, 2016.
- Valerie Scott, Brent Fultz, Noam Izenberg, organizers of Keck Institute of Space Science Workshop on "Venus In Situ Sample Capture Mission" KISS workshop, June 16-July 1, 2021.
- V. Scott, N. Izenberg, and B. Fultz, "Venus In Situ Sample Capture - Part II," Keck Institute of Space Science Workshop II", California Institute of Technology May 9-13, 2022.

Invited Technical Presentations:

- B. Fultz and J. W. Morris, Jr., "Magneto-Mechanical Effects in 304 Stainless Steels", Int'l Cryogenic Materials Conf., Colorado Springs, Co., Aug., 1983.
- B. Fultz, "In-Situ Mössbauer Spectroscopy Studies of Phase Transformations", AIME Symposium on In-Situ Studies of Phase Transformations", TMS-AIME Fall Meeting, Detroit, Mich., Sept., 1984.
- B. Fultz, "Hyperfine Magnetic Field Distributions in Fe-Ni and Fe-10-Ni-1X", Symposium on Industrial Applications of the Mössbauer Effect, 1984 Int'l Chemical Congress of Pacific Basin Socs., Honolulu, Ha., Dec. 16-21, 1984.

- B. Fultz, "The Effects of High Magnetic Fields on the Mechanical Properties of Stainless Steels", Carpenter Technology Corporation, Reading, PA, Sept. 19, 1986.
- B. Fultz "Kinetics of Short Range Ordering in Undercooled Alloys"
University of California, Los Angeles (Oct., 1987)
Arizona State University (Nov., 1987)
- B. Fultz "Kinetics of Ordering in Metallic Alloys", International Conference on the Industrial Applications of the Mössbauer Effect, Parma, Italy (Sept., 1988).
- B. Fultz "Kinetic Paths of Ordering in Metallic Alloys",
Purdue University, West Lafayette (April, 1989)
University of Washington, Seattle (June, 1989)
University of Southern California, Los Angeles (Oct., 1989)
- B. Fultz "Nonintuitive Features of Disorder→Order Transformations", Annual Meeting of The Minerals, Metals, and Materials Society, Anaheim (Feb., 1990).
- B. Fultz, H. Kuwano, and H. Ouyang "A Mössbauer Spectrometry Study of Nanophase Cr-Fe Synthesized by Mechanical Alloying", Acta Metallurgica Conference on Materials with Ultrafine (Nanoscale) Microstructures, Atlantic City, New Jersey, Oct., 1990.
- B. Fultz, "Ultrafine Microstructures Produced by Ball Milling", Jacob Wallenberg Seminar, Utrecht, The Netherlands, Dec. 6, 1990.
- B. Fultz, "Kinetic Paths of Ordering in Nonequilibrium Alloys", European Workshop on Ordering and Disordering, Grenoble, June 10-12, 1991.
- B. Fultz, "Grain Boundary Widths of FCC and BCC Nanophase Materials Prepared by Mechanical Attrition", TMS Annual Meeting, San Diego, 1992.
- B. Fultz, "Kinetics of Disorder→Order Transformation", the Jerome B. Cohen Symposium at the TMS Annual Meeting, San Diego, 1992.
- B. Fultz, "Mössbauer Spectrometric Studies of Ordering in Alloys", International Symposium on the Industrial Applications of the Mössbauer Effect, Otsu, Japan, August, 1992.
- B. Fultz, "Monte Carlo Simulations of Ordering Kinetics", TMS-AMS Fall Meeting, Chicago, November, 1992.
- B. Fultz, "Transient States During the Kinetic Evolution of Non-Equilibrium Materials", Hume-Rothery Symposium (in honor of J. W. Cahn) at the TMS Annual Meeting, Denver, February, 1993.
- B. Fultz, "Thermal Stability of Nanophase Materials Prepared by Mechanical Attrition", TMS Annual Meeting, San Francisco, 1994.
- B. Fultz, "Phase Transformations in Materials Far from Thermodynamic Equilibrium", International Conference on Solid-to-Solid Phase Transformations, Nemaquin Woodlands, PA, July, 1994.

- B. Fultz, "The magnitude and origin of changes in vibrational entropy during solid-state phase transformations", American Physical Society March meeting, 1995.
- B. Fultz, "Alloy Design of LaNi₅-based Materials for Battery Electrodes and Hydrogen Storage", Gordon Research Conference on Hydrogen-Metal Systems, July 16-21, 1995.
- B. Fultz and T. A. Stephens, "Mössbauer Diffraction from Polycrystalline Ordered Alloys", 10th International Conference on Hyperfine Interactions, Leuven, Belgium, August 28 - Sept. 1, 1995.
- B. Fultz, "Kinetics of Short- and Long-Range B2 Ordering in Ternary Alloys", TMS Fall Meeting, Cleveland, OH, Oct.-Nov. 1995.
- B. Fultz and L. B. Hong, "Phase Boundaries in Mechanical Alloying", TMS Fall Meeting, Cleveland, OH, Oct.-Nov. 1995.
- B. Fultz, "Some New Experiments Based on the Mössbauer Effect", Dept. of Physics and Astronomy, University of Toledo, Toledo, Ohio, Nov. 2, 1995.
- B. Fultz, "Designing Nanocrystalline Alloys with Stability Against Grain Growth", TMS Annual Meeting, Anaheim, CA, Feb. 7, 1996.
- Discussion Leader, 1996 Gordon Conference on Physical Metallurgy.
- B. Fultz, "Two New Experiments Based on the Mössbauer Effect", Dept. of Physics, University of Ottawa, Ottawa, Canada, Aug. 26, 1996.
- B. Fultz, "Vibrational Entropy of Materials", Condensed Matter Physics Colloquium, Los Alamos National Laboratory, March 6, 1997.
- B. Fultz, "Two New Methods for Materials Characterization Based on the Mössbauer Effect", Physics Dept. Colloquium, Univ. Texas, El Paso, Mar 26, 1997.
- B. Fultz, "Phonon Partial Densities of States of ⁵⁷Fe in Alloy Phases", Workshop on Inelastic Nuclear Resonant Scattering", Argonne National Laboratory, April 21 - 22, 1997.
- B. Fultz, "Vibrational Entropy of Metals and Alloys", Workshop on Local Structure from Diffraction, Traverse City, Michigan Aug. 10-14, 1997.
- B. Fultz, "Mössbauer Diffraction from Polycrystalline Alloys", International Conference on the Applications of the Mössbauer Effect, Rio de Janeiro, Brazil, September 14-20, 1997.
- B. Fultz and L. J. Nagel, "Anharmonic Effects on the Vibrational Entropy of Alloy Phases", TMS Fall Meeting, Indianapolis, IN, Sept. 14-18, 1997.
- B. Fultz, "Vibrational Entropy and Phonon Densities of States of Materials", U. C. San Diego Condensed Matter Physics Colloquium, Oct. 8, 1997.

- B. Fultz, "Improved Alloys for Ni-MH Batteries", Materials Research Society Spring 1998 Symposium on Hydrogen in Semiconductors and Metals, San Francisco, April, 1998.
- M. E. Manley, L. J. Nagel, and B. Fultz, "Vibrational Entropy Difference between Ordered and Disordered Pd₃V", Hume-Rothery Symposium for R. Kikuchi, TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, H. Frase, C. C. Ahn, J. L. Robertson, S. Spooner, E. E. Alp, W. Sturhahn, T. S. Toellner, R. McQueeney, "Vibrations of Nanocrystals", TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, H. Frase, C. C. Ahn, J. L. Robertson, S. Spooner, E. E. Alp, W. Sturhahn, T. S. Toellner, R. McQueeney, "Vibrations of Nanocrystals", TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, H. Frase, C. C. Ahn, J. L. Robertson, S. Spooner, E. E. Alp, W. Sturhahn, T. S. Toellner, R. McQueeney, "Vibrations of Nanocrystals", TMS Annual Meeting, San Antonio, Feb. 16, 1998.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Oak Ridge National Laboratory, Sept. 1, 1998.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Sandia National Laboratory, Livermore, Nov. 24, 1998.
- B. Fultz, "Inelastic Nuclear Resonant Scattering and Mössbauer Diffractometry of Polycrystals", Physics Colloquium at Old Dominion University, Norfolk, VA, Feb. 11, 1999.
- B. Fultz, H. Frase, J. L. Robertson, "Heat Capacity, Phonons, and Vibrational Entropy of Nanocrystals", TMS Annual Meeting, San Diego, CA, February 1999.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Solid State Sciences Seminar, California Institute of Technology, Pasadena, CA, March 9, 1999.
- B. Fultz, "Vibrational Entropy of Alloy Phases", MRS Spring Meeting, April 7, 1999.
- B. Fultz, C. C. Ahn, R. C. Bowman, Jr., B. V. Ratnakumar, Y. Ye, and C. K. Witham, "Hydrogen in Metals and on Carbons", HRL Laboratories, Malibu, CA, May 25, 1999.
- B. Fultz, "Vibrational Entropies of Alloy Phases", Workshop on Thermodynamic and Structural Properties of Alloy Materials, June 20 - 25, 1999 Oranjestad, Aruba.
- B. Fultz, "Vibrational Entropy and Inelastic Nuclear Scattering", Condensed Matter Seminar, Purdue University, Sept. 17, 1999.
- B. Fultz, "How Studies of Vibrational Entropy Bring Us to 3-ID", DOE Program Evaluation Board for Synchrotron Radiation Instrumentation Beamlines (SRI-CAT) at the Advanced Photon Source, Oct. 7, 1999.

- B. Fultz, "Entropies of Ordered Alloys", Intermetallics for the Third Millennium (ASM symposium in honor of R. W. Cahn, Nov. 1999).
- B. Fultz, "Inelastic Nuclear Resonant Scattering Studies of Phonons in Alloys", MRS Fall Meeting, Boston, Nov. 2, 1999.
- B. Fultz, "Inelastic Neutron Scattering Studies of Vibrational Entropy", LANSCE User's Group Meeting, Santa Fe, NM, Jan. 25, 2000.
- B. Fultz and H. N. Frase, "Grain Boundaries of Nanocrystalline Materials, TMS Annual Meeting, Nashville, TN Mar. 13, 2000.
- B. Fultz, "Vibrational Entropy of Alloy Phases", Materials Colloquium, Johns Hopkins University, Mar. 29, 2000.
- B. Fultz, "Vibrational Entropy of Materials", Materials Science and Mineral Engineering Colloquium, Univ. of Calif. Berkeley Aug. 31, 2000.
- B. Fultz, "The VERTEX Spectrometer", DOE review of the Short Pulse Spallation Source Enhancement Project, Los Alamos National Laboratory, Dec. 5, 2000.
- B. Fultz, "Mossbauer Diffractometry", Lujan Center Seminar, Los Alamos National Laboratory, Feb. 12, 2001.
- B. Fultz, "Mossbauer Diffraction of Materials", 12th International Conference on Hyperfine Interactions, Park City, Utah, Aug. 12-17, 2001.
- B. Fultz, "Structure and Dynamics of Nanocrystalline Materials," ASM Roundtable Meeting, The Boeing Company, Canoga Park, CA April 26, 2001.
- B. Fultz, "The ARCS Spectrometer", SNSWorkshop on the Cold Neutron Chopper Spectrometer, NIST Center for Neutron Research, Gaithersburg, MD, May 21, 2001.
- B. Fultz, "Mossbauer Diffraction of Materials", Materials Research Lecture, California Institute of Technology, May 30, 2001.
- A. F. Yue, I. Halevy, A. Papandrew, P. D. Bogdanoff, B. Fultz, W. Sturhahn, E. E. Alp, and T. S. Toellner "Phonons in intermetallic Pd₃Fe at high pressure", International Conference on the Applications of the Mössbauer Effect, Oxford, England, Sept. 3, 2001.
- B. Fultz, "Coherent and Incoherent Viewpoints of Neutron Scattering from Materials", Joint Institute for Neutron Scattering, Symposium on Studies of Fundamental Phenomena Using Neutrons, Oak Ridge, TN, Oct. 2, 2001.
- B. Fultz, "Excitations and Entropy of Solids Measured by Inelastic Scattering", Condensed Matter Physics Colloquium, Univ. Calif. San Diego, Oct. 17, 2001.
- B. Fultz, "Vibrational Entropy and Inelastic Scattering", Physics Division Colloquium, Argonne National Laboratory, Dec. 7, 2001.

- B. Fultz, "Inelastic Scattering and Vibrational Entropy", Lujan Center Seminar, Los Alamos National Laboratory, Dec. 10, 2001.
- B. Fultz, M. E. Manley, L. J. Nagel, H. Frase, P. D. Bogdanoff, J. L. Robertson, R. J. McQueeney, E. E. Alp, W. Sturhahn, and R. Osborn, "Sources of Entropy in Solid-Solid Phase Transformations", NIST Materials Theory Seminar, Gaithersburg, MD, Jan. 24, 2002.
- B. Fultz, J. Graetz, H. Gabrisch, R. Yazami, C. C. Ahn, "Transmission Electron Microscopy Studies of the Structure and Bonding in LiCoO₂" TMS Annual Meeting, Seattle, WA, Feb. 2002.
- B. Fultz, J.Y.Y. Lin, and U. Kriplani, "Mössbauer Diffractometry," Lecture at the NATO Advanced Research Workshop on Materials Research in Atomic Scale by Mössbauer Spectroscopy, Smolenice, Slovakia, June 2002.
- B. Fultz, J.Y.Y. Lin, and U. Kriplani, "Concluding Remarks," summary presentation at the NATO Advanced Research Workshop on Materials Research in Atomic Scale by Mössbauer Spectroscopy, Smolenice, Slovakia, June 2002.
- B. Fultz, "Anodes and Cathodes Studied by Electron Energy Loss Spectrometry", 11th International Meeting on Lithium Batteries, Monterey, California June 23-28, 2002.
- B. Fultz, "Hydrogen Distributions And Internal Strains In LaNi₅-X Hydrides" Gordon Research Conference on Hydrogen-Metal Systems, Colby College Waterville, ME July 13-18, 2003.
- B. Fultz and J. Y. Y. Lin, "Mossbauer Diffractometry Measurements of Site-Specific Long-Range Order in ⁵⁷Fe₃Al" Annual Meeting of the American Crystallographic Assn., (ACA) Covington, Kentucky, July 31, 2003.
- B. Fultz "ARCS: A wide-Angle Range Chopper Spectrometer for the Spallation Neutron Source", research seminar at the reactor FRM2, Munich Sept., 11, 2003.
- B. Fultz "Sources of Entropy in Solid-Solid Phase Transitions", Physics Colloquium at the Technical University of Munich, Sept., 12, 2003.
- B. Fultz "Transmission Electron Energy Loss Spectrometry Measurements on Electronic Structure of Anode and Cathode Materials for Lithium Batteries". LIBD 2003, Lithium Battery Discussion: Electrode Materials, Bordeaux - Arcachon, France, September 16, 2003.
- B. Fultz "Neutron Scattering Software – a User's Perspective", Neutron Science Software Initiative (NeSSI), Oak Ridge, Oct. 13-15, 2003.
- B. Fultz "Sources of Entropy in Solid-State Phase Transformations", TMS Annual Meeting, Charlotte, North Carolina March 15-18, 2004.
- B. Fultz "Origin of Entropy of Intercalation of Li into Li_yCoO₂", TMS Annual Meeting, Charlotte, North Carolina March 15-18, 2004.

- B. Fultz "Distributed Data Analysis for Neutron Scattering Experiments", NSF Workshop on Cyber Infrastructure April 21, 2004.
- B. Fultz "Nanostructured Anodes and Cathodes for Rechargeable Lithium Batteries" MIT Mechanical Engineering Department Seminar, Nov. 5, 2004.
- B. Fultz "Neutron Scattering and the Entropy of Materials" UCLA Materials Science and Engineering Department Seminar, Jan. 28, 2005.
- B. Fultz "The DANSE Project" Neutron Science Software Initiative Workshop NeSSI-3 at Bishop's Lodge, Santa Fe April 29, 2005.
- B. Fultz "Neutron Scattering and the Entropy of Materials" University of New Orleans Chemistry Dept. Colloquium, May 6, 2005.
- B. Fultz "Entropy of Solid-Solid Phase Transformations: Contributions from Vibrational Dynamics" Solid-Solid Phase Transformations in Inorganic Materials 2005 Pointe Hilton Resort at Squaw Peak, Phoenix, Arizona, June 2, 2005.
- S. Miao, M. Kocher, B. Fultz, P. Rez, Y. Ozawa, R. Yazami, and C. C. Ahn. "Local Electronic Structure of Layered $\text{Li}_x\text{Ni}_{0.33}\text{Mn}_{0.33}\text{Co}_{0.33}\text{O}_2$ " Electrochemical Society Fall Meeting, Los Angeles, October 18, 2005.
- B. Fultz "Mössbauer Diffraction", Fourth Nassau Mössbauer Symposium, Garden City, NY Jan. 14, 2006.
- B. Fultz "Dynamic Data-Driven Data Applications Systems for the Domain of Neutron Scattering Research", Workshop at the National Science Foundation Headquarters, Jan. 19, 2006.
- O. Delaire, T. Swan-Wood, M. Kresch and B. Fultz "Thermodynamics of Impurities in Vanadium" TMS Annual Meeting, San Antonio, Texas March 12-16, 2006.
- B. Fultz "Inelastic Neutron Scattering and Entropy" Dept. of Physics Colloquium, Indiana University, Bloomington, Indiana May 30, 2006.
- B. Fultz "Nanostructured Materials for Lithium and Hydrogen Storage" Keynote talk at MIT Energy Nanotechnology International Conference, June 27, 2006.
- B. Fultz "Inelastic Neutron Scattering and Entropy" Dept. of Physics Colloquium, Occidental College, Los Angeles Sept. 12, 2006.
- B. Fultz "Neutrons and Thermodynamics", Colloquium for the Department of Materials Science and Engineering, University of California, Berkeley, Sept. 21, 2006.
- B. Fultz, J. Dodd, R. Stevens, I. Halevy, R. Yazami, B. Ellis, L.F. Nazar "Dynamical Studies on LiFePO_4 " Annual Meeting of the Electrochemical Society, Cancun, Mexico Oct. 30, 2006.
- B. Fultz, "Anharmonic Phonon Thermodynamics at High Temperatures", The U.S.-China Workshop Series on Neutron Scattering Science and Technology - The Inaugurating Meeting, Beijing, Nov. 13, 2006.

- B. Fultz, O. Delaire, M. Kresch, M. Lucas, T. Swan-Wood, J.L. Robertson, " Neutron Scattering and the Entropy of Materials " Hume-Rothery Award Symposium in honor of Simon Moss, TMS Annual Meeting, Orlando FL, Feb. 28, 2007.
- B. Fultz, "Materials that Store Hydrogen and Lithium", Jet Propulsion Laboratory (sponsored by the Office of the Chief Scientist and Chief Technologist) April 18, 2007.
- B. Fultz, "Neutron Scattering and the Entropy of Materials " Colloquium talk for the Department of Chemical Engineering and Materials Science, Univ. of Calif., Davis, Oct. 29, 2007.
- B. Fultz, invited workshop on "Enhanced National Capability for Neutron Scattering," Sept. 5-7, 2007, at the Humphrey's Half-Moon Bay Hotel in San Diego, CA.
- H. Tan, J. Dodd, and B. Fultz "Temperature and Composition Dependence of Electron Hopping in LiFePO₄ Studied by Mössbauer Spectrometry", Focused Battery Technology Workshop-III, Materials Challenges for High Energy Density and Long-life Lithium-Ion cells, Feb. 18,19, 2008 Caltech, Pasadena, CA.
- B. Fultz, invited workshop on "Building a Network for Neutron Scattering Education," Marriott Westfields, Chantilly, Virginia March 27-28, 2008.
- B. Fultz, "Pressure-Induced Invar Transitions" 5th International Nassau-Argonne Mössbauer Symposium, May 8-9, 2008 at Argonne National Laboratory, Argonne, Illinois, 60439, USA
- B. Fultz, "Entropy, Inelastic Neutron Scattering and Computation" June 11, 2008, Spallation Neutron Source science colloquium.
- B. Fultz, "Collaborative Software Development," Discussion Chair at NOBUGS 2008 November 3-5, 2008 in Sydney, Australia near the Australian Nuclear Science and Technology Organisation.
- B. Fultz, M. McKerns, M.A.G Aivazis "Technical and Management Issues in Collaborative Software Construction" NOBUGS 2008 November 3-5, 2008 in Sydney, Australia near the Australian Nuclear Science and Technology Organisation.
- B. Fultz, "Neutron Scattering and the Entropy of Materials " Colloquium talk for the Department of Materials Science and Engineering, Univ. of Calif., Irvine, Feb. 13, 2009.
- B. Fultz, "Inelastic Neutron Scattering Studies of Material Dynamics and Thermodynamics" TMS Annual Meeting, San Francisco, Feb. 17, 2009.
- B. Fultz, "Developments in Neutron Scattering and the Entropy of Materials" University of New Orleans AMRI Symposium Feb. 20, 2009.

- B. Fultz, "Neutron Scattering and the Entropy of Materials" Science Kickoff Talk for the DOE BES Triennial Review of Spallation Neutron Source and High Flux Isotope Reactor, Oak Ridge, Tennessee, March 24, 2009.
- B. Fultz, "DANSE and Inelastic Neutron Scattering" Fourth Workshop on Inelastic Neutron Spectrometers, Oak Ridge, Tennessee, May 1-2, 2009.
- B. Fultz, "Vibrational Thermodynamics at High Temperatures" Hume—Rothery Symposium in honor of Didier de Fontaine, TMS Annual Meeting, Seattle, WA Feb. 14-18, 2010.
- J. Purewal, H. Smith, B. Fultz, C. Brown, C. Ahn, J.B. Keith, "Hydrogen Diffusion in Intercalated Graphite Studied by Quasielastic Neutron Scattering", American Conference on Neutron Scattering 2010, Ottawa, Canada. June 26-30, 2010.
- B. Fultz, "DANSE and the Virtual Neutron Facility", Spallation Neutron Source, Oak Ridge TN, Mar. 5, 2010.
- B. Fultz, "Phonons in Consolidated Nanocrystals", Vibrations at Surfaces, VAS-13, University of Central Florida, Orlando, FL, Mar. 9-13, 2010.
- Justin Purewal, Hillary Smith, Brent Fultz, Craig Brown, Channing Ahn and Brandon Keith, "Diffusion in Potassium Intercalated Graphite Studied by Quasielastic Neutron Scattering," American Conference for Neutron Scattering, Ottawa, Canada June 26-30, 2010.
- B. Fultz, "Thermodynamics of Materials at High Pressures", Invited lecture, Synchrotron X-Ray Methods in High Pressure Research, Course organizers Guoyin Shen (APS) and Stephen Gramsch (Carnegie Inst.). Sept 16-18, 2010.
- B. Fultz, "High Temperature Thermodynamics and Atom Vibrations", TMS Annual Meeting, San Diego, CA (Brent Fultz Honorary Symposium) Feb. 28, 2011.
- B. Fultz, "Non-Harmonic Phonon Thermodynamics", ISIS seminar, Rutherford-Appleton Laboratory, U.K. Aug. 16, 2011.
- B. Fultz, "Workflows in Computational Scattering Science", Plenary Lecture, ASCR/BES Data Workshop, October 24-25, 2011, Bethesda MD.
- B. Fultz, "Non-Harmonic Phonon Thermodynamics and Negative Thermal Expansion," Spallation Neutron Source Scattering Science Division Seminar, Oak Ridge National Laboratory, Dec. 7, 2011.
- B. Fultz, "Non-Harmonic Phonon Thermodynamics", Condensed Matter and Materials Division Seminar, Lawrence Livermore National Laboratory, Dec. 13, 2011.
- Nicholas P. Stadie, John J. Vajo, Philippe Mauron, Andreas Borgschulte, Andreas Züttel, Channing C. Ahn, Brent Fultz "Zeolite-templated carbon materials for high pressure hydrogen storage", Sixth International Symposium on Hydrogen and Energy, Stoos, Switzerland, January, 2012.

- B. Fultz, "Electron-phonon interactions in iron-vanadium alloys," Progress in Nuclear Resonance Scattering: from Methods to Materials, WE-Heraeus-Seminar at the Physikzentrum Bad Honnef, Germany, 27 Feb. 2012.
- B. Fultz, "Non-Harmonic Phonon Thermodynamics" TMS Annual Meeting, Orlando, FL Mar. 12, 2012.
- B. Fultz, "Vibrational Entropy at High Temperatures" CALPHAD 41 conference Berkeley, CA June 3-8, 2012.
- B. Fultz, Chen Li, Xiaoli Tang, Jorge Munoz, Sally Tracy, Douglas Abernathy, "Anharmonic Phonons and Negative Thermal Expansion of Cubic ScF_3 " American Conference on Neutron Scattering, Georgetown, MD, June 24-28, 2012.
- B. Fultz, "Vibrational Thermodynamics of Materials" 2012 Neutron Scattering PI Meeting, sponsored by Office of Basic Energy Sciences, U.S. DoE. Germantown, MD, July 22-25, 2012.
- B. Fultz, "Inelastic X-Ray Scattering Studies of Phonons and Thermodynamics of Materials", plenary talk at the HPCAT Workshop on Advances in Matter under Extreme Conditions. October 10-12, 2012, Advanced Photon Source, Argonne National Laboratory, Argonne, IL USA.
- B. Fultz "Electrochemical Thermodynamic Measurements Using the Temperature Dependence of the Open Circuit Voltage" HRL Laboratories Oct. 29, 2012.
- B. Fultz "Anharmonic Phonons and Thermodynamics," 7th North American Mossbauer Symposium, Austin, TX, Jan 11-12, 2013.
- B. Fultz, "Other Sources of Entropy in Alloys," Symposium on High Entropy Alloys, TMS Annual Meeting, San Antonio, TX, Mar. 3-7, 2013.
- B. Fultz, X. Tang, and Chen Li, "Anharmonic Phonons and Thermodynamics," Hume-Rothery Symposium in honor of Alex Zunger, TMS Annual Meeting, San Antonio, TX, Mar. 3-7, 2013.
- B. Fultz, invited participant to CALPHAD workshop on Unary Phase Diagrams, Ringberg Castle, Bavaria, Germany (March 24-29, 2013).
- B. Fultz, "Vibrational Entropy of Materials", Forschungskolloquium des Fachbereiches Materialforschung & Physik 2013, Universitat Salzburg. Fachbereich Materialforschung und Physik, Hellbrunnerstrasse 34/III, A-5020 Salzburg. April 2, 2013.
- B. Fultz, "Phonon thermodynamics at moderate pressures", Workshop on High-Pressure Neutron Scattering, Neutron Scattering Science Division, Oak Ridge National Laboratory, June 5, 2013.
- B. Fultz, S. Tracy, L. Mauger, "Polaron Dynamics in LiFePO_4 ", Dynamics of Molecules and Materials-II, University of Glasgow, Scotland, July 5, 2013.

- B. Fultz, “Better Scattering Experiments through Computation,” SIXNS workshop organized by Simon J.L. Billinge. Brookhaven National Lab., Aug. 14,15, 2013.
- B. Fultz, “Vibrational Entropy of Materials,” Department of Materials Science and Engineering Colloquium, University of Tennessee, Knoxville, Aug. 30, 2013.
- B. Fultz, “Vibrational Entropy of Materials,” Materials Research Lecture, California Institute of Technology, Oct. 16, 2013.
- B. Fultz, “Vibrational Entropy in Metallic Alloys.” TMS Annual Meeting, San Diego, CA, Feb. 20, 2014.
- B. Fultz, “Outcomes of SIXNS-1,” Workshop on a Software Institute for X-Ray and Neutron Scattering – III,” Seattle, WA Jan 17-18, 2014.
- B. Fultz, “A Computational Scattering Science Institute,” First nanoHUB User Meeting, Phoenix, AZ Mar. 9-11, 2014.
- B. Fultz, S. Tracy, and L. Mauger, “Activation Volume and Polaron Dynamics in LiFePO₄,” Frontier High-pressure Sciences at Synchrotron Facilities, Advanced Photon Source User Group Meeting, May 11-14, 2014.
- B. Fultz, “Inelastic Neutron Scattering,” Croucher Summer School on Neutron Scattering, Hong Kong, China, Aug. 10-15, 2014.
- B. Fultz, “Entropy, Phonons, and Nuclear Resonant X-Ray Scattering,” SLAC Photon Science Seminar Series, Sept. 3, 2014.
- B. Fultz, “Vibrational Entropy of Materials” Materials Science Department Colloquium, University of California Santa Barbara, Oct. 10, 2014.
- B. Fultz, “Vibrational Entropy of Materials” Applied Physics and Materials Science in the 21st Century, California Institute of Technology, Nov. 6, 2014.
- B. Fultz, “Mössbauer Spectrometry” Nuclear Resonant Scattering Workshop, Argonne National Laboratory, Nov. 8, 2014.
- B. Fultz and L. Mauger, "A Nuclear Resonant Inelastic X-Ray Scattering Study of the Stabilization of bcc Fe by Magnon-Phonon Interactions", Eighth North American Mössbauer Symposium, Northeastern University, Boston, Jan 8-9, 2015.
- B. Fultz and H. Smith, “Vibrational Dynamics and Thermodynamics of Nanocrystals ” Symposium in honor of Armen Khachaturyan, TMS Annual Meeting, Orlando, FL, Mar. 15-19, 2015.
- B. Fultz, "The Entropy of Materials," Technical Seminar, College of Engineering, California State University Long Beach, March 25, 2015.
- B. Fultz, L. Mauger, F. Körmann, B. Grabowski, M. S. Lucas, J. A. Muñoz, S.J. Tracy, B. Dutta, T. Hickel, and J. Neugebauer. “Stabilization of bcc Fe by Magnon-Phonon Interactions”, International Conference on Phase Transformations in Materials, Whistler, British Columbia, Canada PTM 2015.

- B. Fultz, "Computation, the Gibbs Free Energy, and Inelastic Scattering," DyProSo2015, 35th Symposium on Dynamical Properties of Solids, Freising, Bavaria, Germany, Sept. 13-17, 2015.
- B. Fultz, "The Origin of Entropy in Materials," Keynote talk, William Hume-Rothery Award Symposium, TMS Annual Meeting, Nashville, TN, Feb. 14-18, 2016.
- B. Fultz, "Inelastic Neutron Scattering," Croucher Summer School on Neutron Scattering, Hong Kong, China, Aug. 7-12, 2016.
- B. Fultz, "Computational Scattering Science," Croucher Summer School on Neutron Scattering, Hong Kong, China, Aug. 7-12, 2016.
- B. Fultz, "Where Does the Entropy in Materials Come from, and What Controls It?" Materials Research Lecture, California Institute of Technology, Oct. 19, 2016.
- B. Fultz, "Introduction to Mössbauer Spectroscopy," Workshop on the Nuclear Resonant Scattering and Data Analysis, Argonne National Laboratory, Nov. 11, 2016.
- B. Fultz, "The Origin of Entropy in Materials," TMS webinar, Dec. 15, 2016, 1 PM EST.
- B. Fultz, "Where Does the Entropy of Materials Come From?" Condensed Matter Physics Seminar, University of Colorado, Boulder April 27, 2017.
- B. Fultz, "Where Does the Entropy of Materials Come From?" MSE Spring 2017 Colloquium, University of California Riverside, May 17, 2017.
- B. Fultz, "The Origin of Entropy in Materials" Dept. Physics and Atmospheric Science, Dalhousie University, Halifax, Canada, Aug. 3, 2017.
- B. Fultz, "Where does the entropy of materials come from?" MSE Colloquium, SUNY Binghamton, Oct. 4, 2017.
- B. Fultz, P. Ahn, and T. Strobel, "Effects of Simultaneous Pressure and Temperature on the Stability of Silicon₂₄" MRS Annual Meeting, Boston Nov. 30, 2017.
- B. Fultz, "New directions for inelastic neutron scattering studies of anharmonic phonons", Centre Europeen de Calcul Atomique et Moleculaire (CECAM) Workshop on Anharmonicity and Thermal Properties of Solids, Paris, January 10-12, 2018.
- B. Fultz, four lectures at the Croucher Summer School on Neutron Scattering, City University of Hong Kong, Hong Kong, China, July 8-14, 2018. "Theory of Inelastic Neutron Scattering," "Inelastic Neutron Scattering Studies of Phonons," "Multiphonon Corrections for Inelastic Neutron Scattering," "Computational Scattering Science."
- B. Fultz, D.S. Kim, O. Hellman, "Thermal expansion anomalies of silicon originate primarily from phonon anharmonicity with zero-point energy,"

Hume-Rothery Symposium for Mark Asta, 2019 TMS Annual Meeting San Antonio TX.

- B. Fultz, "Large Scale Computation and Neutron Scattering," Gordon Research Conference on Neutron Scattering May 06, 2019 Hong Kong, China.
- B. Fultz, "Nuclear Resonant Inelastic X-ray Scattering at Pressure and Temperature," Advanced Spectroscopy Probes to Investigate Matter Under Extreme Conditions - Opportunities Afforded by the MBA Lattice. Remote Presentation for the Advanced Photon Source, Sept. 3, 2020.
- B. Fultz, S. Lohaus, and P. Guzman, " Nuclear Resonant X-ray Scattering at Pressure and Temperature: Applications to Thermophysics" Expert Workshop on Nuclear Resonant Scattering. Virtual meeting Jan. 15, 2021, organized by Spring8 in Japan.
- B. Fultz, "Phonon entropy at high temperatures and pressures," Chicago-DOE Alliance Center research webinar Feb 10, 2021.
- B. Fultz, Y. Shen, C.N. Saunders, C.M. Bernal, M.E. Manley, "Phonon Anharmonicity Causes the Large Thermal Expansion of NaBr". Hume-Rothery Award Symposium in honor of Ji-Cheng (JC) Zhao, TMS Annual Mtg. (virtual) Feb. 2021.
- B. Fultz, "New capabilities of inelastic neutron scattering for studying anharmonic phonons" Mater. Res. Society Spring virtual Meeting, Seattle, April, 2021.
- B. Fultz, "Interactions of Phonons and Magnetism" International Conference on the Applications of the Mössbauer Effect, ICAME2021. Virtual presentation for Brasov, Romania. Sept. 6, 2021.
- B. Fultz, "Future of Neutron Scattering" DOE BES neutron scattering PI virtual meeting, invited Dec. 17, 2021.
- B. Fultz, " Phonon Anharmonicity Beyond Perturbation Theory" Hume-Rothery Award Symposium, TMS Annual Mtg. Anaheim California, March 2022.
- B. Fultz, "Sorting out the thermodynamics of Invar by Mössbauer spectrometry", invited talk at symposium for Prof. Gary Long, U.C. San Diego, March 19, 2022.
- B. Fultz, "Where does the entropy of materials come from?" Invited graduate seminar, Alfred University Mar. 24, 2022 remote presentation.
- B. Fultz, TBA, Symposium DS01: Modern Materials Thermodynamics for the 2022 MRS Fall Meeting, Boston, MA, Nov. 2022.

Outreach Talks

- B. Fultz "Towards a Metal Hydride-Air Battery," Science Colloquium, New Community Jewish High School, West Hills, CA, Sept. 9, 2013.

- B. Fultz "Paths into Science" talk/chat with 6-8th grade science class and teachers, Brett Harte Preparatory Middle School, Los Angeles, CA May 18, 2021.

ARCS Project

Principal Investigator for the construction of A wide Angular-Range, direct-geometry, time-of-flight Chopper Spectrometer (ARCS) at the Spallation Neutron Source in Oak Ridge, TN. This instrument will be optimized to provide a high neutron flux at the sample, and a large solid angle of detector coverage, advancing the science of dynamical processes in materials.

Proposal funded 15 Sept. 2001 at M\$ 14.9 over 5 years. CD4 Project Complete Oct. 1, 2007.

Inelastic Scattering Workshops Organized:

ARCS IDT Meeting, breakout session of SHUG meeting, Oct. 12, 2005

SEQUOIA/ARCS IDT Meeting, Caltech, Mar. 20, 2005

Caltech-SNS Software Workshop, Caltech Dec. 13, 2002

ARCS IDT Meeting, Los Alamos, Sept 30, 2002

DOE Baseline Review and Software Workshop, Caltech, March 14-16 2002

ARCS IDT Mini-meeting, Caltech, Sept 24, 2001

DANSE Project

Principal Investigator for DANSE: Distributed Data Analysis for Neutron Scattering Experiments. This is an NSF-funded construction project to build a new software system for doing neutron scattering science by computer. It includes software engineering and neutron science subprojects.

Design Proposal funded 3 Aug. 2004 at M\$ 0.98 over 1 year.

Construction Proposal funded 1 June 2006 - 31 May, 2012 at M\$ 11.97 over 5 years plus 1 year no-cost extension.

Software Workshops Organized:

Last DANSE. Science Meeting with Developers, Caltech, May 4-6, 2011

DANSE Developers' Meeting, Caltech, Sept. 20-22, 2010

DANSE Developers' Meeting, Spallation Neutron Source, May 20-22, 2010

DANSE Developers' Meeting, Caltech, Jan. 28-30, 2010

DANSE Developers' Meeting, Caltech, Sept. 24-26, 2009

DANSE Developers' Meeting, Caltech, May 27-29, 2009

DANSE Developers' Meeting, Caltech, Jan. 26-28, 2009

DANSE Developers' Meeting, Caltech, Aug. 25-27, 2008

DANSE Developers' Meeting, Caltech, Feb. 21-23, 2008

DANSE Developers' Meeting, Caltech, Sept. 20-22, 2007

DANSE Developers' Meeting, Manassas VA, May 29-31, 2007

DANSE Developers' Meeting, SNS, Jan. 22, 23, 2007

DANSE Kickoff Meeting, Caltech, Aug. 15, 16, 2006

DANSE Site Visit and Baseline Review, Oak Ridge TN, Dec. 15,16, 2005
DANSE Software Workshop and Developers' Meeting, Caltech, Mar. 16-19,
2005
DANSE Software Technology Workshop, Caltech, June 22-23, 2004.
DANSE Workshop, Caltech, Sept. 4-9, 2003
DANSE Organizational Meeting, Caltech, Mar 13, 2003

Present Graduate Students Supervised

Claire Saunders, Materials Science, Ph.D. expected 2021
Stefan Lohaus, Materials Science, Ph.D. expected 2022
Camille Bernal, Materials Science, Ph.D. expected 2022
Cullen Quine, Materials Science, Ph.D. expected 2022
Pedro Guzman, Materials Science, Ph.D. expected 2023
Ziyi Wang, Materials Science, Ph.D. expected 2024
Vladimir Ladygin, Materials Science, Ph.D. expected 2025

Former Ph.D. Students Supervised

1. Douglas Harvey Pearson, “Measurements of White Lines in Transition Metals and Alloys Using Electron Energy Loss Spectrometry”, Ph.D. in Applied Physics, California Institute of Technology, September 30, 1991.
presently: Associate, Jones Day, Washington D.C.
2. Hao Ouyang, “Grain Boundaries of Nanophase Materials”, Ph.D. in Materials Science, California Institute of Technology, October 12, 1992.
presently: Professor of Materials Science and Engineering, National Tsing-Hua University Taiwan.
3. James Kozo Okamoto, “Temperature-Dependent Extended Electron Energy Loss Fine Structure Measurements from K, L₂₃, and M₄₅ Edges in Metals, Intermetallic Alloys, and Nanocrystalline Materials”, Ph.D. in Applied Physics, California Institute of Technology, May 6, 1993.
presently: Attorney at Law, deGuzman Okamoto & Benedicto LLP, 2672 Bayshore Pkwy, Suite 509, Mountain View, CA
4. Lawrence Anthony, “Kinetics of Disorder→Order Transformations in Highly Nonequilibrium Materials”, Ph.D. in Materials Science, California Institute of Technology, May 24, 1993.
formerly: Assistant Prof. of Physics, Toledo Univ., present address unknown.
5. Zheng-Qiang Gao, “The Kinetics of Ordering, Grain Growth, and Chemical Segregation in Nonequilibrium Fe₃X Alloys (X = Al, Si, and Ge)”, Ph.D. in Materials Science, California Institute of Technology, May 18, 1994.
presently: Pilkington Aerospace, California.

6. Liubo Hong, "Structures and Stabilities of Nanocrystalline Materials Synthesized by Mechanical Alloying and Modeled as Driven Alloys", Ph.D. in Materials Science, California Institute of Technology, Sept. 25, 1995.
presently: Global Sr. Director, Wafer Engineering, Western Digital.
7. Tab Allen Stephens, "Chemical Environment Selectivity in Mössbauer Diffraction", Ph.D. in Materials Science, California Institute of Technology, May 14, 1996.
presently: Motorola Research, Austin, TX
8. Laura Jeanne Nagel, "Vibrational Entropy Differences in Materials", Ph.D. in Materials Science, California Institute of Technology, June 18, 1996.
presently: Lecturer, and Academic Adviser, Dept. Materials Science and Engineering, Univ. Illinois, Urbana-Champaign.
9. Heather Nicole Frase, "Vibrational and Magnetic Properties of Mechanically Attrited Ni₃Fe Nanocrystals", Ph.D. in Materials Science, California Institute of Technology, April 9, 1998.
presently: Data Scientist, Ninja Analytics, Falls Church, VA.
10. Charles K. Witham, "The Effects of Alloy Chemistry on the Electrochemical and Hydriding Properties of Ni-Substituted LaNi₅", Ph.D. in Materials Science, California Institute of Technology, June 4, 1999.
presently: deceased Aug. 2002. previously: technical staff, JPL.
11. Ushma Kriplani, "Kinematical Mössbauer Diffraction from Polycrystalline ⁵⁷Fe", Ph.D. in Physics, California Institute of Technology, April 18, 2000.
presently: Interim Associate Laboratory Director, Science & Technology Partnerships and Outreach, at Argonne National Laboratory.
12. Adrian Hightower, "Lithium Electronic Environments in Rechargeable Battery Electrodes", Ph.D. in Materials Science, California Institute of Technology, July 14, 2000.
presently: Manager, Metropolitan Water District of Southern California Member, Board of Directors at Aid Africa. previously: Assistant Professor of Engineering, Harvey Mudd College.
13. Yun Ye, "Interaction of Hydrogen with Novel Carbon Materials", Ph.D. in Materials Science, California Institute of Technology, August 8, 2000.
presently: member of the Technical Staff, Siebel Systems
14. Michael E. Manley, "From Elementary Excitations to Microstructure: the thermodynamics of metals and alloys across length scales," Ph.D. in Materials Science, California Institute of Technology, April 25, 2001.
presently: Senior Researcher at Oak Ridge National Laboratory.
15. Nathan R. Good, "The Influence of Texture on the Magnetoelastic Properties of Cold Rolled Polycrystalline TbDy Alloys" Ph.D. in Applied Physics, May 24, 2001.
presently: Engineer Systems Architect at Northrop Grumman Corporation, Studio City, CA.
16. Peter D. Bogdanoff, "The Phonon Entropy of Metals and Alloys: The effects of thermal and chemical disorder" Ph.D. in Materials Science, Nov. 20, 2001.

- presently: Chief Scientist, XCOM Wireless, Inc, Signal Hill, CA.
17. Jason Graetz, "Electronic Environments and Electrochemical Properties of Lithium Storage Materials", Ph.D. in Materials Science, May 7, 2003.
presently: Group Leader in Electrochemistry, HRL Laboratories, Malibu, CA. formerly: Scientific Group Leader, Brookhaven National Lab.
 18. Jiao Lin, "Mössbauer Diffractometry: Principles, Practice, and an Application to a Study of Chemical Order in $^{57}\text{Fe}_3\text{Al}$ ", Ph.D. in Materials Science, May 10, 2004.
presently: Member of Technical Staff, Oak Ridge National Laboratory.
 19. Yvan Reynier, "Electrode Thermodynamics and Kinetics for Lithium-Ion Batteries" (co-advised with Dr. Rachid Yazami, CNRS, Directeur de These). Ph.D. in Materials Science, Grenoble University, France. May 25, 2005.
presently: unknown. formerly: Postdoctoral Fellow, CNRS, Grenoble.
 20. Tabitha L. Swan-Wood, "Vibrational Entropy Contributions to the Phase Stability of Iron and Aluminum Based Binary Alloys", Ph.D. in Materials Science, August 12, 2005.
presently: Adjunct Professor, Applied Physics, California State Univ. Channel Islands.
 21. Yasunori Ozawa, "Aging Study of Positive Electrode Materials for Lithium Ion Batteries" (main adviser was Dr. Rachid Yazami, CNRS, Directeur de These). Ph.D. in Materials Science, Grenoble University, France. October 19, 2005.
presently: Postdoc at MEET Battery Research Center Münster, North Rhine-Westphalia, Germany, Technical Staff, Enax Co., Japan.
 22. Alexander B. Papandrew, "The Effects of High Pressure on the Vibrational and Magnetic Properties of Iron-Based Materials" Ph.D. in Materials Science, January 23, 2006.
presently: Research Assistant Professor, Univ. Tennessee, Knoxville.
 23. Olivier Delaire, "The Phonon Entropy of BCC Transition Metals and Alloys: Effects of Impurities and of a Martensitic Phase Transition" Ph.D. in Materials Science, May 12, 2006.
presently: Professor of Mechanical Engineering and Materials, Duke University.
formerly: Clifford Shull Postdoctoral Fellow, Oak Ridge National Lab.
 24. Shu Miao, "Electronic Structure of Energy Storage Materials" Ph.D. in Materials Science, Jan. 30, 2007.
presently: Associate Professor, Dalian Institute of Chemical Physics, China.
 25. Joanna Dodd, "Phase Composition and Dynamical Studies of Lithium Iron Phosphate" Ph.D. in Materials Science, March 14, 2007.
presently: Technical Staff Member, Aerospace Corp.
 26. Matthew S. Lucas, "Cluster Expansion Method Applied to Inelastic Scattering Experiments" Ph.D. in Materials Science, July 25, 2008.
presently: Contractor with Air Force Research Lab, Dayton. formerly: Lead Technologist, General Electric, Cincinnati, Ohio.

27. Max G. Kresch, "Temperature Dependence of Phonons in Elemental Cubic Metals Studied by Inelastic Scattering of Neutrons and X-Rays" Ph.D. in Materials Science, Nov. 17, 2008.
presently: Tools and Systems Engineer at Marft, Inc., Green Bay, WI.
28. Justin Purewal, "Physisorption of Hydrogen in Alkali-Metal Graphite Intercalation Compounds" Ph.D. in Materials Science, Feb. 9, 2010.
presently: Member of Research Staff, Ford Motor Company Research Lab, Dearborn, MI.
29. Michael Lon Winterrose, "Pressure-Induced Invar Effect in Pd₃Fe" Ph.D. in Materials Science, Aug. 23, 2010.
presently: Technical Staff, MIT Lincoln Laboratory, Lexington Mass.
30. Hongjin Tan, "A Study of the Thermodynamics and Kinetics of Li_xFePO₄ as a Cathode Material for Li Batteries", Ph.D. in Materials Science, Oct. 19, 2011.
presently: detained.
31. Chen Li, "Phonon anharmonicity of ionic compounds and metals", Ph.D. in Materials Science, May 4, 2012.
presently: Assistant Professor of Mechanical Engineering, Univ. Calif. Riverside.
32. Nicholas P. Stadie, "Synthesis and Thermodynamic Studies of Physisorptive Energy Storage Materials", Ph.D. in Materials Science, Nov. 5, 2012.
presently: Assistant Professor of Chemistry, Montana State Univ. Bozeman.
33. David Gregory Abrecht, "Thermodynamic Properties of Organometallic Dihydrogen Complexes for Hydrogen Storage Applications", Ph.D. in Chemical Engineering, Dec. 4, 2012.
presently: Senior Chemical Engineer and Technical Team Lead, Pacific Northwest National Laboratory.
34. Jorge Alberto Muñoz, Jr., "Electronic Structure and phonon thermodynamics of iron alloys", Ph.D. in Materials Science, May 20, 2013.
presently: Asst. Prof. of Physics, University of Texas, El Paso.
35. Tian Lan, "Studies of Phonon Anharmonicity in Solids" Ph.D. in Applied Physics, May 6, 2014.
presently: Ginko LLC, Incline Village, NV.
36. Hillary L. Smith, "Phase Transformations and Entropy of Non-Equilibrium Materials" Ph.D. in Materials Science, May 29, 2014.
presently: Assistant Professor of Physics, Swarthmore College.
37. Lisa Mary Mauger, "Phonon Thermodynamics of Iron and Cementite" Ph.D. in Applied Physics, May 28, 2015.
presently: Signal Analysis Engineer, Jet Propulsion Laboratory.
38. Sally June Tracy, "Polaron hopping in olivine phosphates studied by nuclear resonant scattering" Ph.D. in Materials Science, Sept. 3, 2015.
presently: Staff Scientist, Carnegie Institution of Washington.

39. Maxwell Robert Murialdo, “Anomalous Thermodynamics of Nonideal Gas Physisorption on Nanostructured Carbons” Ph.D. in Materials Science, July 28, 2016.
presently: Research Scientist in the Materials Science Division , Lawrence Livermore National Lab.
40. Dennis Sungtae Kim, “Silicon Revisited: Understanding pure phonon anharmonicity and the effects on thermophysical properties” Ph.D. in Materials Science, August 21, 2017.
presently: postdoctoral fellow, Univ. Calif. Los Angeles.
41. Nicholas J. Weadock, “Addressing Thermodynamic Inefficiencies of Hydrogen Storage in Transition Metal Hydrides” Ph.D. in Materials Science, January 22, 2019.
presently: postdoctoral fellow, Stanford University.
42. Fred Chae-Reem Yang, “High Temperature Electron-Phonon and Magnon-Phonon Interactions,” Ph.D. in Materials Science, March 25, 2019.
presently: Omniscience.
43. Jane Elizabeth Herriman, “Phonon thermodynamics and elastic behavior of GaN and GaAs at high temperatures and pressures,” Ph.D. in Materials Science, Feb. 14, 2020.
presently: Technical Consultant, Lawrence Livermore National Laboratory.
44. Yang Shen, “Phonon Anharmonicity at the Limits of Perturbation Theory,” Ph.D. in Applied Physics, May 27, 2020.
presently: Omiscience.
45. Claire Nicole Saunders, "Thermal Behavior of Cuprous Oxide: A Comprehensive Study of Three-Body Phonon Effects and Beyond" Ph.D. in Materials Science, May 19,2022.

Scientists/Research Fellows/Visitors Presently Supported

Dr. Channing C. Ahn

Dr. David Boyd

Dr. Risaku Toda

Research Fellows/Visitors Formerly Supported (often partial support)

Prof. Hussein Hamdeh (1987-89)
presently: Prof. of Physics, Wichita State University

Prof. Hisashi Kuwano (1989-90)
presently: Muroran Institute of Technology

Prof. Rainer Birringer (1991-92)

presently: Prof. of Materials Science, U. Augsburg, FRG
Prof. Werner Keune (1991)
Deceased. Formerly: Prof. of Physics, U. Duisburg, FRG.

Dr. Tim Lindsey (1992-93)
presently: member of technical staff, SAIC.

Prof. Chandrahas Bansal (1993-94)
presently: Prof. of Physics, U. Hyderabad, India

Dr. Marius Birsan, Jan. 1996 - Nov. 1997
presently: Defence Scientist, Defence Research & Development Canada Atlantic,
Dartmouth, Nova Scotia

Prof. Gerard Le Caër, Sept. 1996 - May 1997
presently: School of Mines, Nancy, France

Dr. Robert C. Bowman (part-time support 1994-98)
presently: retired.

Dr. B. V. Ratnakumar (part-time support 1994-98)
presently: Member Technical Staff, Battery Systems Group, Electric Power Systems
Section, Jet Propulsion Laboratory

Dr. Jennifer Dooley (part-time support 1997)
presently: Member of the Technical Staff, Jet Propulsion Laboratory

Dr. Robert McQueeney (part-time support 1998)
presently: Professor of Physics, Iowa State University, Ames.

Dr. Heather Nicole Frase (1998-99)
presently: Data Scientist, Ninja Analytics. formerly: member of technical staff, Institute
for Defense Analyses, Alexandria, VA

Dr. Itzhak Halevy (1999-2000), again (2005-2006)
presently: Physics Department, NRCN, Beer - Sheva, Israel

Dr. Ushma Kriplani (2000-2001)
presently: Interim Associate Laboratory Director, Argonne National Laboratory.

Dr. Heike Gabrisch (2000-2003)
presently: Scientist, GKSS Research Center, Geesthacht, Germany (previously,
Assistant Professor of Chemistry, University of New Orleans.)

Dr. Jason Graetz (2003)
presently: Group Leader, HRL Laboratories, Malibu, CA.

Dr. JaeDong Lee (2002-2004)
presently: Staff Member, National Institute for Materials Science, Tsukuba, Japan.

Dr. Anne Dailly (2003-2005)
presently: Technical Staff Member, General Motors Research Lab., Warren, Michigan.

Dr. Tim Kelley (2002-2005)
presently: Technical Staff Member, Los Alamos National Laboratory, NM.

Dr. Rachid Yazami, CNRS, Grenoble, France (2001-2006), again (2009-2010).
presently: Professor, Division of Materials Science, Nanyang Technological University,
Singapore. Winner of 2014 Charles Stark Draper Prize for Engineering.

Dr. Doug Abernathy, Argonne National Laboratory, Argonne, IL. (2001-2008)
presently: Instrument Scientist, Spallation Neutron Source, Oak Ridge National Lab.,
Oak Ridge, TN.

Dr. Michael A.G. Aivazis (2006-2011)
presently: Owner of Urban Radish, Los Angeles. formerly: Center for Advanced
Computing Research, Caltech.

Dr. Michael McKerns (2008-2011)
presently: Technical staff, Enthought.

Dr. Nikolay D. Markovskiy (2008-2010)
presently: High performance computing development engineer, NVIDIA, Moscow.

Dr. Xiaoli Tang (2008-2011)
presently: OSIsoft, San Leandro, CA.

Dr. Alex Dementsov (2008-2011)
presently: Vita Explorer, startup in Santa Barbara CA.

Dr. J. Brandon Keith (2008-2011)
presently: software startup, Pasadena, CA

Dr. Hongjin Tan (2014-2015).
presently: Liox Corporation, Pasadena, CA.

Dr. Jiao Lin (2004-2015)
presently: Technical Staff, Oak Ridge National Laboratory

Dr. Tian Lan (2014-2015)
presently: Algorithm developer, Ginko LLC, Incline Village, NV.

Dr. Heng Yang (2015-2016)
presently: Postdoctoral Fellow, Caltech.

Prof. Olle Hellman (2013-2018)
presently: Linköping University, Sweden and Weizmann Institute of Science,
Israel

Dr. Hillary Smith (2015-2018)
presently: Asst. Prof. Physics, Swarthmore College