Bianca Haberl

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Education:

2011	Ph.D. (physics), Australian National University (ANU), Canberra Australia; Thesis title: "Structural Characterization of Amorphous Silicon"
2006	Diplom/M.Sc. (physics), University of Augsburg, Germany
Feb 2002 – Feb 2003	Internship at the Australian National University, Canberra, Australia

Professional Experience:

Dec 2018 – present	R&D Staff Scientist, Neutron Sciences Directorate, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee Leader of the High-Pressure Science Initiative, High-Pressure Neutron Scientist, Sample Environment Section, Neutron Scattering Division (NSD), ORNL.
Oct 2017 – Dec 2018	Instrument Scientist for dedicated high-pressure instrument (SNAP diffractometer), Spallation Neutron Source, ORNL
Nov 2016 – Dec 2018	High-Pressure Science Coordinator, Neutron Sciences Directorate, ORNL A cross-cutting, cross-divisional role with responsibility for driving coordination, development, scientific endeavours and outreach for the high-pressure science and technology program.
Aug 2014 – Nov 2016	Weinberg Fellow, ORNL Distinguished Staff Fellowship with responsibility to the laboratory's mission and individual research.
Jul 2011 – Apr 2014	Postdoctoral Researcher, Research School of Physics and Engineering, Australian National University, Canberra, Australia (including promotion to ANU Level B in 2013) Research position with some teaching responsibilities at undergraduate and graduate level.

Research Interests:

My research interests are centered on the phase behavior of the Group IVa elements carbon, silicon and germanium and their hydrides under extreme conditions, specifically pressure. A key focus is the synthesis of novel exotic structures that can be recovered to ambient conditions from local energy minima in their high-pressure landscape and that exhibit highly advantageous properties such as a hardness higher than that of diamond, characteristics superior for solar power conversion and other semiconductor applications, or enabling new methods for energy transport.

These aims are facilitated through detailed *in situ* investigation of fundamental phase diagrams during application of extreme conditions using neutron and X-ray scattering, the exploitation of disordered precursor materials for their lower kinetic barriers and in-depth characterization of precursor and recovered materials. This is accompanied by the technological development of large-volume high pressure capabilities for high-pressure neutron scattering and large-volume synthesis.

Scientific publications:

In total I have published 83 scientific publications, specifically 75 peer-reviewed journal articles, 4 peer-reviewed book chapters, and 4 peer-reviewed conference contributions. Through these I have an H-index of 23, a G-index of 36, and an i10-index of 48 with over 1600 total citations (as per google scholar). On these publications, I am 1st author on 15 and 2nd author on another 24, yielding a **1st/2nd author** H-index of 20, G-index of 31, and i10-index of 26 (as per google scholar). Further, more recently I am **more often last/second last author**, for example on 8 out of 31 publications since 2019.

A full list is appended.

Advisory and Funding Panels:

- Panel Member of the "*Scientific and Technical Advisory Panel (STAP) 'Materials and Physics Support'* (formerly *'Sample Environment')*" of the European Spallation Source, since Nov 2020 and forward (Lund, Sweden).
- Committee Member of ORNL's Seed Funding Allocation Committee, since April 2022 and forward.
- Panel Member of the *'DoE Triennal Review for HPCAT (Sector 16)'* of the Advanced Photon Source, Argonne National Laboratory, April 2022 (IL, USA).

Awards:

- "2021 ORNL Innovation Award" as a Licence Award for licencing with ExOne, 2021.
- "Neutron Spirit Award" for the *"Virtual National Neutron and X-ray Summer School 2021"*, in an NSD-wide Award ceremony, 2021.
- "Best Experiment Award" for *"Vibrational properties of hydrogen under pressure"* in an NSD-wide competitive Award ceremony, 2019.
- Best Senior Poster Award, joint meeting of the International Association for the Advancement of High Pressure Science and Technology (AIRAPT) & European High Pressure Research Group (EHPRG), 2015.
- Best Student Presentation, Australian Microbeam Analysis Society Meeting XI, 2011.
- Materials Research Society (MRS) Graduate Student Silver Award, MRS Spring Meeting, 2010.
- Best Oral Paper Award, International Union of Materials Research Societies (IUMRS) – International Conference on Electronic Materials (ICEM), 2008.
- Graduate Student Award, Australian Nanoindentation Workshop, 2005.

Conference Presentations:

I regularly present contributed oral presentations at conferences relevant to high pressure physics (e.g. EHPRG, AIRAPT, HPSP), to neutron scattering (e.g. ACNS, ICNS), to materials science and physics (e.g. APS March Meeting, MRS, E-MRS, Euromat, IUMRS) and to crystallography (IUCr, ACA). I have also been invited for research seminars at research institutions (e.g. national laboratories) and universities in Europe and Australia as well as to high level internal seminars at ORNL and ANU. Finally, I have presented the following **invited presentations**:

1. B. Haberl et al., *"In situ high pressure neutron scattering for materials characterization"*, TMS 2023, San Diego, California, USA, March 19-23, 2023.
2. B. Haberl et al., *"Neutron diffraction of superconducting superhydrides and other metal hydrides"*, 2022 IUCr Workshop on High Pressure Crystallography, Chicago, Illinois, USA, December 6-10, 2022.

3. B. Haberl, lecture on "*Innovations in High Pressure Neutron Scattering*", 56th International School of Crystallography "Crystallography under extreme conditions: the future is bright and very compressed", June 3-11, 2022, Erice, Italy.
4. B. Haberl, *"High-pressure neutron scattering: Hydrides and Group IVa Materials,"* CDAC Seminar Series (Virtual), Chicago, IL, October 21, 2020.
5. B. Haberl, *et al.*; *"High pressure neutron scattering in a diamond anvil cell",* International Collaboration on Advanced Neutron Sources (ICANS XXIII), Chattanooga, Tennessee, USA, October 13-18, 2019.
6. B. Haberl, *et al.*; *"Quantum materials under high pressure – New Capabilities at ORNL"*, Southeastern Section of the American Physical Society (SESAPS) meeting, Knoxville, Tennessee, USA, November 8–10, 2018.
7. B. Haberl, *"High pressure capabilities at Oak Ridge National Laboratory"*, Workshop on Single-crystal Neutron Diffraction from Quantum Materials under Pressure, Ames Laboratory, Iowa, USA, May 30, 2018.
8. B. Haberl, *et al.; "High pressure neutron scattering in a diamond anvil cell at Oak Ridge National Laboratory"*, 55th European High Pressure Research Group meeting, Poznan, Poland, September 3–8, 2017.
9. B. Haberl, et al.; *"Recent advances in in situ high pressure neutron diffraction on disordered materials"*, American Conference on Neutron Scattering, Los Angeles, California, USA, July 10–14, 2016.
10. B. Haberl, et al.; *"Amorphous semiconductors under pressure: Enabling controlled synthesis of metastable crystalline phases by complementary ex situ and in situ characterization"*, 66th Annual Meeting of the American Crystallographic Association, Denver, Colorado, USA, July 22–26, 2016.
11. B. Haberl, *et al.; "Synthesis of the new metastable polymorphs bt8-Si and st12-Si through laser-induced microexplosions"*, International Conference on Exotic Forms of Silicon, Golden, Colorado, USA, July 15–17, 2015.
12. B. Haberl, *et al.; "Rate dependent pathways for the high pressure synthesis of novel metastable phases in Group IV elements"*, High Pressure Collaborative Access Team (HPCAT) Workshop on Time-resolved Synchrotron Techniques, Advanced Photon Source, Argonne National Laboratory, Illinois, USA, September 25–27, 2014.
13. B. Haberl, *et al.; "Amorphous semiconductors under pressure: A complementary approach of point loading and diamond-anvil cell techniques"*, HPSTAR (Center for High Pressure Science & Technology Advanced Research) – Shanghai Synchrotron Radiation Facility (SSRF) Workshop, Shanghai, China, September 2013.

Licencing agreements and patents:

- ExOne licenses ORNL method of 3D printing lightweight ceramic metal, June 2020: https://www.ornl.gov/news/exone-licenses-ornl-method-3d-print-components-refined-neutron-scattering
- United States Patent US 11,538,597 B2 for *"Additive manufacturing of composite neutron absorbing components",* by David C. Anderson, Amelia M. Elliott, Bianca Haberl, Garrett E. Granroth, Dec 2022.
  This was submitted as United States Patent Application 20200411203, Dec 2020
  https://www.freepatentsonline.com/y2020/0411203.html

Service to Community:

- Director of the National School on Neutron and X-ray Scattering (NXS) since 2018, a federally funded school held together with Argonne National Laboratory. While the schools are generally onsite schools, 2020 and 2021 were held fully virtually/remotely.
  - Experiences from the first virtual NXS2020 are published in Neutron News: M. Frontzek, B. Haberl, M.E. Manley, U. Ruett, S. Rosenkranz, *"The 22nd National School on Neutron & X-ray*

Scattering 2020 – Upsides of going virtual", **Neutron News 31,** 4-6 (2020). doi.org/10.1080/10448632.2020.1822694

- Description of the second virtual NXS2021 including remote experimentations is published in Neutron News: M. Frontzek, B. Haberl, M.E. Manley, U. Ruett, S. Rosenkranz, "*The 23rd National School on Neutron & X-Ray Scattering 2021—Virtual School with Remote Experiments"*, **Neutron News 32**, 12-16 (2021). doi.org/10.1080/10448632.2021.1996855

- Lead of the NSD High Pressure Science Initiative since 2018.
- Chair of the High-Pressure Sample Environment Steering Committee at NScD, Nov 2016 – Sep 2019.
- Member of the "Women in Neutron Sciences" (WiNS), ORNL steering committee 2016-2019; sub-committee chair, 2016-2018; advisory chair, 2017/2018; member at large, 2019.
- Co-organizer of an ORNL workshop on *"Total Scattering Measurements under High Pressure"*, Oct 2019.
- Guest Editor for the *"Special Topic: Advances in Modern Neutron Diffraction"* containing 14 peer-reviewed manuscripts published in Review of Scientific Instruments, September 2018.
- Key organizer of an *"EFree Neutron Day"* meeting at ORNL, December 2015.
- Conference assistant at the ARNAM Workshop 2009, IUMRS-ICEM 2008, and the Australian Nanoindentation Workshops 2007 and 2009.
- Reviewing of journal manuscripts and for grant funding agencies (National Science Foundation, EU Horizon, Australian Research Council).

Conference and Symposium Organization:

- Session Chair and Member of Conference Organizing Committee of the 80th Pittsburgh Diffraction Conference (Pittsburgh, PA), Oct 2023.
- Symposium Chair and Organizer at the 2023 XXVI Congress and General Assembly of IUCr, (Melbourne, Australia) titled *"Using High-pressure Diffraction to Design and Understand Functionality"*, Aug 2023.
- Symposium Chair and Organizer at the 2022 Meeting of the American Crystallographic Association (Portland, OR) titled: *"Emergent phenomena through high pressure, low temperature, high field, and other extreme conditions"*, Aug 2022.
- Scientific Advisory Committee/Symposium Organizer at EHPRG 2020 (Puerto de la Cruz, Spain).
- Symposium Chair and Organizer at the 2020 Meeting of the American Crystallographic Association (Virtual) titled: *"Extreme environments of pressure, temperature and field"*, Aug 2020.
- Lead Symposium Organizer at Euromat 2019 (Stockholm, Sweden) titled: "*Synthesis, optimization and characterization through extreme conditions of energy-relevant materials",* Sep 2019.
- Scientific Advisory Committee/Symposium Organizer at EHPRG 2019 (Prague, Czech Republic) with a focus on Large Scale Facilities/High Pressure Neutron Scattering.
- Co-Organizer at the American Physical Society March Meeting 2019 (Boston, MA) of: *"Focus Session: Matter in Extreme Conditions"*, Mar 2019.
- Organizing committee member of the joint Australian Research Network for Advanced Materials (ARNAM)/ Australian Research Council Nanotechnology Network (ARCNN) 2010 workshop.

Teaching and Supervision Experience:

- Lecturing on high pressure/extreme conditions at NXS 2018, 2019, and 2022 (in person), and NXS 2020, 2021 (virtual).
- Lecturing in ANU Advanced Physics 2 in 2011 and 2012 with innovative and experimental teaching methods to improve understanding and retention (real-time gathering platforms, e.g. piazza, interactive class experiments and discussion etc.).

- Significant experience in one-on-one tutoring and teaching of Honours, MPhil and PhD students from Australia and the USA.
- **ORNL Summer Student Supervisor:**
  (1) GEM student, Yessica Nelson, Summer 2021 (postponed from 2020).
- **PhD thesis advisees** (as co-supervisor on ANU supervisory board):
  (1) L.B. Bayu Aji (Ph.D. 2014, now at Lawrence Livermore National Laboratory, CA, USA);
  (2) S. Wong (Ph.D. 2018, now at CSIRO Australia);
  (3) T.B. Shiell (Ph.D. 2018, now at FedTech, VA, USA);
  (4) L.Q. Huston (Ph.D. 2019, now at CSIRO Australia).
- **Postdoctoral associates** (co-mentored):
  (1) Dr. Fahima Islam (ORNL, FY 2019/20, now at Neutron Technology Division, ORNL);
  (2) Dr. Mary Ellen Donnelly (ORNL, FY 2020-2022, now at Neutron Scattering Division, ORNL).

Research Grants, Travel Fellowships and other Funding:

I have successfully secured funding for research, development and outreach. I continue to be involved with funding applications to the Department of Energy as well as through international collaboration.

Since joining ORNL, I have been Principal Investigator (PI) on two ORNL projects funded through the Laboratory Directed Research and Development Program (LDRD) projects to a total of U$683K and was collaborator on one further ORNL LDRD project for a total U$849K. Further, I am/was collaborating overseas investigator on a total of three research grants by the Australian Research Council to a total of A$1,540K, I am the ORNL-PI for DoE FWP funding for the National School on Neutron and X-ray Scattering, and I have obtained internal equipment funding as well as external travel funding.

Prior to joining ORNL, I was one of several Chief Investigators on two grants from the Australian Research Council, was involved with major equipment/infrastructure grants and obtained several travel fellowships and travel funds.

Professional Organizations:

- **European High Pressure Research Group** since 2011. I contributed as poster judge, chair of "Women under Pressure" sessions in 2017 and 2018 and joined the Program Committee for 2019 and 2020.
- **Member AIRAPT** (International Association for the Advancement of High Pressure Science and Technology) since 2013.
- **Member Neutron Scattering Society of America** since 2016. Contributed to WiNS networking events, 2016, 2018.
  - The 2016 WiNS event was described and published in Neutron News: B. Haberl, C. Hoffmann, V. E. Lynch, *"Networking and Leisure Talk at ACNS 2016",* **Neutron News 27**, 11 (2016). doi.org/10.1080/10448632.2016.1237250
- **Member American Physical Society** since 2018**.**
- **Member American Crystallographic Association** since 2018.

Full list of publications

ResearcherID: F-9058-2011, ORCID: 0000-0002-7391-6031

1. A.G. Salek, P.Y. Le, J.G. Partridge, T. Raeber, B. Haberl, R. Boehler, B. Murdoch, J. E. Bradby, T. Ratcliff, R. Elliman, D.R. McKenzie and D.G. McCulloch, *"The structure and electronic properties of tetrahedral bonded hydrogenated amorphous carbon"*, accepted with **Applied Physics Letters** (Apr 2023).
2. L. Rapp, T. Matsuoka, K.L. Firestein, D. Sagae, H. Habara, K. Mukai, K.A. Tanaka, E. Gamaly, R. Kodama, Y. Seto, T. Syobu, A. Tominaga, L. Smilie, B. Haberl, T. Pikuz, T. Yabuuchi, T. Togash, Y. Inubushi, M. Yabashi, S. Juodksme, D.V. Golberg, A.V. Rode, N. Ozaki, "*Search for High-Pressure Silicon Phases: Reaching the Extreme Conditions with High-Intensity Laser Irradiation",* in *"Ultrafast Laser Nanostructuring - The Pursuit of Extreme Scales",* Eds. R. Stoian and J. Bonse, **Springer Series in Optical Sciences Vol. 239**, 471-494 (2023). doi.org/10.1007/978-3-031-14752-4_13
3. B. Haberl, M. Guthrie, R. Boehler, *"Advancing neutron diffraction for accurate structural measurement of light elements at megabar pressures",* **Scientific Reports 13**, 4741 (2023). doi.org/10.1038/s41598-023-31295-3
4. R. Boehler, B. Haberl, J.J. Molaison, M. Guthrie, *"Development of large-volume diamond anvil cell for neutron diffraction: The neutron diamond anvil cell project at ORNL",* in "*Static and Dynamic High Pressure Mineral Physics",* Eds. Y. Fei and M. Walter, 79-92 (Cambridge University Press, 2022). ISBN: 978-1108479752
5. L. Yang, A. Karandikar, R.B. Shiell, B.A. Cook, S. Wong, M.R. Field, J.E. Bradby, B. Haberl, D.G. McCulloch, R. Boehler, "*Melting diamond in the diamond cell by laser-flash heating*", **High Pressure Research 43** (2022). doi.org/10.1080/08957959.2022.2160246
6. B.L. Winn, C. Broholm, M. Bird, B. Haberl, G.E. Granroth, J. Katsaras, "*TITAN: a flexible neutron spectrometer concept with a new ultra-high field steady-state vertical bore-magnet",* **Review of Scientific Instruments 93**, 123903 (2022). doi.org/10.1063/5.0122934 – ***Invited paper***
7. B. Haberl, D.G. Quirinale, C.W. Li, G. E. Granroth, H. Nojiri, M.-E. Donnelly, S.V. Ushakov, R. Boehler, B.L. Winn, "*Multi-extreme conditions at the Second Target Station",* **Review of Scientific Instruments 93** 083907 (2022). https://doi.org/10.1063/5.0093065 – ***Invited paper***
8. M-E. Donnelly, Y. Wu, E. Kroll, J.J. Molaison, M. Frontzek, B. Haberl, "*High-pressure neutron diffraction on WAND² with a Paris-Edinburgh press*", **High Pressure Research 42**, 213-225 (2022). doi.org/10.1080/08957959.2022.2062242
9. A. Basu, M. Mookherjee, E. McMahan, B. Haberl, R. Boehler, *"Behavior of long-chain aliphatic hydrocarbons at high pressure and temperature: Implication for Meteoritic Processes*", **The Journal of Physical Chemistry B 126**, 2530-2537 (2022). doi.org/10.1021/acs.jpcb.1c10786
10. B. Haberl, M.E. Donnelly, J.J. Molaison, M. Guthrie, R. Boehler, *"Methods for Neutron Diffraction Studies on Hydride Superconductors and other Metal Hydrides"*, **Journal of Applied Physics 130**, 215901 (2021). doi.org/10.1063/5.0069425 – ***Invited paper***
11. F. Islam, B. Haberl, J. Lin, D.C. Anderson, J.J. Molaison, G.E. Granroth, *"Novel data analysis method for obtaining better performance from a complex 3D-printed collimator"*, **Nuclear Instruments and Methods A 1014**, 165646 (2021). doi.org/10.1016/j.nima.2021.165646
12. B. Haberl, J.J. Molaison, M. Frontzek, E. Novak D. Goldsby, A. Elliott, D.C. Anderson, *"3D-printed B4C collimators for the Paris-Edinburgh cell",* **Review of Scientific Instruments 92,** 093903 (2021). doi.org/10.1063/5.0055095

13. J. Sharma, M. Musselman, B. Haberl, C.E. Packard, *"In situ synchrotron diffraction of pressure-induced phase transition in $DyPO_4$ under variable hydrostaticity"*, **Physical Review B 103,** 184105 (2021). doi.org/10.1103/PhysRevB.103.184105

14. A. Basu, M. Mookherjee, C. Schiffert, B. Haberl, R. Boehler, *"Spectroscopic investigation of the high pressure and temperature behavior of aliphatic hydrocarbon: Implications for planetary processes"*, **ACS Earth and Space Chemistry 5**, 449 (2021). doi.org/10.1021/acsearthspacechem.0c00259

15. E. Gati, J.M. Wilde, R. Khasanov, L. Xiang, S. Dissanayake, R. Gupta, M. Matsuda, F. Ye, B. Haberl, U. Kaluarachchi, R.J. McQueeney, A. Kreyssig, S. L. Bud'ko, P.C. Canfield, *"Formation of short-range magnetic order and avoided ferromagnetic quantum-criticality in pressurized $LaCrGe_3$",* **Physical Review B** 103, 075111 (2021). doi.org/10.1103/PhysRevB.103.075111 – ***Editors' suggestion***

16. L.Q. Huston, A. Lugstein, G. Shen, D.A. Cullen, B. Haberl, J.E. Bradby, J.S. Williams, *"Synthesis of Novel Phases in Si Nanowires Using Diamond Anvil Cells at High Pressures and Temperatures",* **Nanoletters 21**, 1427 (Jan 2021). doi.org/10.1021/acs.nanolett.0c04354

17. T.B. Shiell, D.G. McCulloch, J.E. Bradby, B. Haberl, D.R. McKenzie, *"Neutron diffraction discriminates between models for the nanoarchitecture of graphene sheets in glassy carbon"*, **Journal of Non-Crystalline Solids 554**, 120610 (2021). doi.org/10.1016/j.jnoncrysol.2020.120610

18. D.G. McCulloch, S. Wong, T.B. Shiell, B. Haberl, B.A. Cook, X. Huang, R. Boehler, D.R. McKenzie, J.E. Bradby, *"Investigation of Room Temperature Formation of the Ultra-Hard Nanocarbons Diamond and Lonsdaleite"*, **Small 16**, 2004695 (2020). doi.org/10.1002/smll.202004695

19. L.A. Smillie, M. Niihori, L. Rapp, B. Haberl, J.S. Williams, J.E. Bradby, C.J. Pickard, A.V. Rode, *"Exotic silicon phases synthesized through ultrashort laser induced microexplosion: characterization with Raman microspectroscopy",* **Physical Review Materials 4**, 093803 (2020). doi.org/10.1103/PhysRevMaterials.4.093803

20. E. Novak, B. Haberl, L.L. Daemen, J.S. Molaison, T. Egami, N. Jalarvo, *"Pressure-induced phase transition in barium hydride studied with neutron scattering"*, **Applied Physics Letters 117** (5), 051902 (2020). doi.org/10.1063/5.0011646

21. F. Islam, J. Lin, T. Huegle, I. Lumsden, D.C. Anderson, A. Elliott, B. Haberl, G.E Granroth*, "Computational Optimization of a 3D printed collimator"*, **Journal of Neutron Research 22**, 155-168 (2020). doi.org/10.3233/JNR-190139

22. B. Massani, J.J. Molaison, L.L. Daemen, A. Dos Santos, X. Wang, B. Haberl, R. Boehler, M. Guthrie, J. Loveday, *"On single-crystal neutron diffraction in DACs: Quantitative structure refinement of light elements on SNAP and TOPAZ",* **High Pressure Research 40**, 339 (2020). doi.org/10.1080/08957959.2020.1767100

23. A. Basu, P. Murphy, M. Mookherjee, B. Haberl, R. Boehler, *"High-pressure behavior of a linear chain alkane, tricosane"*, **Journal of Applied Physics 127**, 105901 (2020). doi.org/10.1063/1.5143450

24. N. Osti, B. Haberl, N. Jalarvo, J.J. Molaison, R. Boehler, R. Goyette, E. Mamontov, *"Dynamics of a room temperature ionic liquid under applied pressure"*, **Chemical Physics 530,** 110628 (2020). doi.org/10.1016/j.chemphys.2019.110628

25. C.L. Cramer, A.M. Elliott, J. Kiggan, B. Haberl, D.C. Anderson, *"Processing of complex-shaped collimators made via binder jet additive manufacturing of B_4C and pressureless melt infiltration of Al"*, **Materials & Design 180,** 107956 (2019). doi.org/10.1016/j.matdes.2019.107956

26. T. B. Shiell, S. Wong, W. Yang, C. Tanner, B. Haberl, R.G., Elliman, D.R. McKenzie, D.G. McCulloch, J. E. Bradby, *"The composition, structure and properties of four different Glassy Carbons",* **Journal of Non-Crystalline Solids 522,** 119561 (2019). doi.org/10.1016/j.jnoncrysol.2019.119561

27. S. Wong, B.C. Johnson, B. Haberl, A. Mujica, J.C. McCallum, J.S. Williams, J.E. Bradby, *"Thermal evolution of the indentation-induced metastable phases of silicon"*, **Journal of Applied Physics 126**, 105901 (2019). doi.org/10.1063/1.5108751

28. K. Chapagain, D.E. Brown, S. Kolesnik, S. Lapidus, B. Haberl, J.J. Molaison, C. Lin, C. Kenney-Benson, C. Park, E. Markiewicz, B. Andrzejewski, J.W. Lynn, S. Rosenkranz, B. Dabrowski, O. Chmaissem, *"Tunable Multiferroic Order Parameters in $Sr_{1-x}Ba_xMn_{1-y}Ti_yO_3$"*, **Physical Review Materials 3,** 084401 (2019). doi.org/10.1103/PhysRevMaterials.3.084401

29. B. Haberl, J.J. Molaison, J.C. Neuefeind, L.L. Daemen, R. Boehler, *"Modified Bridgman anvils for high pressure synthesis and in situ neutron diffraction"*, **High Pressure Research 39**, 426 (2019). doi.org/10.1080/08957959.2019.1624744

30. M. Guthrie, R. Boehler, J.J. Molaison, B. Haberl, A.M. dos Santos, C.A. Tulk, *"Structure and disorder in ice VII on the approach to hydrogen-bond symmetrisation"*, **Physical Review B 99**, 184112 (2019). doi.org/10.1103/PhysRevB.99.184112

31. S. Wong, B. Haberl, B.C. Johnson, A. Mujica, M. Guthrie, N. Stavrias, J.C. McCallum, J.S. Williams, J.E. Bradby, *"Formation of an r8 dominant Si material",* **Physical Review Letters 122,** 105701 (2019). doi.org/10.1103/PhysRevLett.122.105701

32. T. B. Shiell, C. de Tomas, D.G. McCulloch, D.R. McKenzie, R. Boehler, A. Basu, I. Suarez Martinez, N. Marks, B. Haberl, J. E. Bradby, *"In situ analysis of the structural transformation of glassy carbon under compression at room temperature"*, **Physical Review B 99**, 024114 (2019). doi.org/10.1103/PhysRevB.99.024114

33. H. Cao, B.C. Chakoumakos, K. Andrews, Y. Wu, R.A. Riedel, J. Hodges, W. Zhou, R. Gregory, B. Haberl, J.J. Molaison, G.W. Lynn, *"DEMAND, a Dimensional Extreme Magnetic Neutron Diffractometer at High Flux Isotope Reactor",* **Crystals 9**, 5 (2019). doi.org/10.3390/cryst9010005

34. J. Frantti, Y. Fujioka, J.J. Molaison, R. Boehler, B. Haberl, C.A. Tulk and A.M. dos Santos, *"Compression mechanisms of ferroelectric PbTiO3 via high pressure neutron scattering"*, **Journal of Physics: Condensed Matter 30,** 435702 (2018). doi.org/10.1088/1361-648X/aae342.

35. A. Podlesnyak, M. Loguillo, G.M. Rucker, B. Haberl, R. Boehler, G. Ehlers, L.L. Daemen, D. Armitage, M.D. Frontzek, M. Lumsden, *"Clamp cell with in situ pressure monitoring for low-temperature neutron scattering measurements"*, **High Pressure Research 38,** 482 (2018). doi.org/10.1080/08957959.2018.1519560.

36. K. Page, B. Haberl, L. Coates, M. Tucker, *"Preface: Special topic on advances in modern neutron diffraction at Oak Ridge National Laboratory"*, **Review of Scientific Instruments 89**, 092601 (2018). doi.org/10.1063/1.5055785.

37. B. Haberl, S. Dissanayake, Y. Wu, D. A.A. Myles, A. M. dos Santos, M. Loguillo, G.M. Rucker, D.P. Armitage, M. Cochran, K.M. Andrews, C. Hoffmann, H. Cao, M. Matsuda, F. Meilleur, F. Ye, J.J. Molaison, R. Boehler, *"Next-generation diamond cell and applications to single-crystal neutron diffraction",* **Review of Scientific Instruments 89**, 092902 (2018). doi.org/10.1063/1.5031454.

38. S. Calder, K. An, C.R. Dela Cruz, M.D. Frontzek, B. Haberl, A. Huq, S.A.J. Kimber, J.J. Molaison, J. Neuefeind, K.L. Page, A.M. dos Santos, C. Tulk, M. G. Tucker, "*A suite-level review of the neutron powder diffraction instruments at Oak Ridge National Laboratory",* **Review of Scientific Instruments 89**, 092701 (2018). doi.org/10.1063/1.5033906.

39. A. M. dos Santos, J. J. Molaison, B. Haberl, L. Krishna, K. Page, M. Loguillo, X. P. Wang, "*The high pressure gas capabilities at ORNL's neutron suite",* **Review of Scientific Instruments 89**, 092907 (2018). doi.org/10.1063/1.5032096.

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