

CURRICULUM VITAE FOR JOHN HARDING

January 7, 2024

John Harding
Department of Mathematical Sciences
New Mexico State University

Office telephone: (505) 646-4315
Department office: (505) 646-3901
e-mail: hardingj@nmsu.edu

Education:

Ph.D., McMaster University, 1991, Advisor G. Bruns
M.Sc., McMaster University, 1988, Advisor G. Bruns
B.Sc., McMaster University, 1987

Career history:

Department head, Mathematical Sciences, New Mexico State University, 2019 –
Full Professor, New Mexico State University, 2005 –
Associate Professor, New Mexico State University, 1999 – 2005
Assistant Professor, New Mexico State University, 1996 – 1999
Assistant Professor, Brandon University, 1993 – 1996
NSERC Postdoctoral Fellow, Vanderbilt University, 1991 – 1993

Courses taught:

Calculus I (191), II (192), III (291), Vector Analysis (391), Differential Equations (392), Intro. Modern Algebra (331), Intro. Analysis (Math 332), Discrete Math (278), Finite Math (279), Math Appreciation (Math 210G), Algebra I (581), Algebra II (582), Linear Algebra (480), Quantum computing (530), Lattice Theory (466/506), Combinatorics (430), Axiomatic Set Theory (557), Foundations of Geometry (452), Universal Algebra (585), Great Theorems: Art of Mathematics (411), Mathematical Logic (454/504), Discrete Mathematics (330), Lattice Theory (501), Algebra I (481), Algebra II (482), Advanced Linear Algebra (525), Measure Theory (593), Real Analysis (594), Computer Science I, II (Brandon), Applied Statistics (Brandon), Survey Sampling (Brandon), Real Analysis (Brandon), Discrete Structures and Algorithms (Brandon)

Graduate Students:

Miguel Peinado, Ph.D., current
Jianfeng He, Ph.D., current

Maria Cruz, Ph.D., Completions of Pseudo Ordered Sets, 2019
Taewon Yang, Ph.D., The Logic of Bundles, 2015
Qin Yang, Ph.D., Regular Completions of Lattices, 2012
Barret Church, M.Sc., \mathbb{Z}_2 -valued states, 2005

Numerous master's students without thesis.

Grants, Awards:

Outstanding Department Head Award, Arts and Sciences, 2024.
Arts and Sciences Outstanding Faculty Award for NMSU, 2007
D. C. Rousch Award for Excellence in Teaching, received January 2004.
International Quantum Structures Association Research Award 2000.

NSF RTG Grant 2231414: Research Training Group in Logic and its Application, 2023-2028, \$1,382,740
US Army Grant W911NF-21-1-0247: Logic and Geometry in Quantum Computing 2021-24, \$347,700
Foundational Questions Institute Research Award: Events as Decompositions, 2015-2017, \$44,250
NSF Award for a series of conferences (BLAST) Co-PI, 2006-2010
NMSU Minigrant 110576, 2006
NMSU Summer Research Award, 2004
NMSU Minigrant RC-01-006, 2001
NMSU Summer Research Award, 2000
NMSU Summer Research Award, 1998
NMSU Minigrant 01-3-43882, 1998 - 1999
NMSU Minigrant 01-3-43856, 1997 - 1998
NSERC Research Grant OGP0155640, 1994-1996
NSERC Postdoctoral Fellowship, 1991-1993
NSERC Postgraduate Scholarships 1988-1991

Service and Professional Duties:

Treasurer, International Quantum Structures Association, 2022-

Vice President, International Quantum Structures Association, 2016-2018

President, International Quantum Structures Association, 2014-2016

Birkhoff-Von Neumann Prize Committee IQSA, 2011-2012

Councilor, International Quantum Structures Association, 1998-2002, 2006-2008

Editorial Board of *Order* 2001 –

Advisory Board *Mathematica Slovaca*, 2007 -

Referee for: *Algebra and Its Applications*, *Algebra Universalis*, *Applied Categorical Structures*, *Comment. Math. Univ. Carolinae*, *Inter. J. of Theoretical Physics*, *Journal of Soft Computing*, *Mathematische Nachrichten*, *Order*, *Studia Logica*, *Tatra Mountains Mathematical Publications*, *The Houston J. Math.*, *Mathematica Slovaca*, *Fuzzy Sets and Systems*, and others.

Reviewer for *Mathematical Reviews*

NMSU Committees: Graduate Studies for Math (including Chair 2005-2009), Advisory Committee, Graduate Council (2005-2006), College Curriculum and

Educational Policies Committee, University Research Council, Ad hoc Committee on Long Term Hiring in Mathematics, Arts and Science Advising, Tenure and Promotion to Associate Professor Committee, Promotion to Professor Committee, External member of Tenure and Promotion for Chemistry, Undergraduate Curriculum Committee, Undergraduate Majors and Minors Committee

Chair Local Organizing Committee, ASL conference, Las Cruces, May 2025
Program Committee LATD 2023, Tblisi
Program Committee BLAST 2023, Chapel Hill
Program Committee IQSA 2022, Tropea
Program Committee TACL 2022, Coimbria
Program Committee BLAST 2022, Boulder
Organizing Committee BLAST 2021, NMSU
Program Committee LATD 2020, Tblisi
Program Committee QPL 2019, Chapman
Program Committee TACL 2019, Nice
Co-Chair, Program committee for TACL 2017, Prague
Program Committee IQSA 2017, Nijmegen
Organizing Committee for the BLAST conference, NMSU, 2015.
Organizing Committee for the BLAST conference, Lawrence 2010.
Co-Organizer for the BLAST conference, NMSU 2009
Organizing Committee for the BLAST conference, Denver 2007.
Organizing committee for NMSU/UTEP workshop Spring 2007.
Organizing Committee for the biennial International Quantum Structures Association meeting, Denver, July 17 – 22, 2004.
Co-organizer of a conference “Philosophical logic meets mathematical logic: from classical to quantum”, Brussels, Feb 4 – 7, 2004.
Co-organizer of the 1999 NMSU Holiday Symposium
Organizer of a weekly Lattice Theory Seminar, 1996-2012

Publications

- [1] Gabriel Agnew, Uziar Gutierrez-Hougarly, J. Harding, Ilya Shapirowsky, and Jackson West, On distance logics of Euclidean spaces, submitted to *Studia Logica*.
- [2] J. Harding and A. Kornell, Completely hereditarily atomic OMLs, to appear in *Math. Slovaca*.
- [3] J. Harding, J. McDonald and M. Peinado, Monadic ortholattices: completions and duality, to appear in *Alg. Univ.*
- [4] J. Harding, Quantum cylindric set algebras, submitted to *IJTP*.
- [5] G. Bezhanishvili and J. Harding, Duality theory for the category of stable compactifications. *Topology Proc.* 61 (2023), 1-30.
- [6] G. Bezhanishvili, J. Harding and P. J. Morandi, Remarks on hyperspaces for Priestley spaces, *Theoret. Comput. Sci.* 943 (2023), 187-202.
- [7] J. Harding, Quantum monadic algebras, *J. Phys. A* 55 (2022), no. 39, Paper No. 394001, 27 pages.

- [8] J. Harding and Z. Wang, Logical aspects of quantum structures, invited contribution for Financial Econometrics: Bayesian analysis, quantum uncertainty, and related topics, Studies in Systems, Decision and Control, 85-104. Proceedings of ECONVN 2022, Thatch, Kreinovich, Ha and Trung Eds. Springer 2022.
- [9] J. Harding and Hung Nguyen, Luders rule and conditional probability for commuting events, 43-56, invited contribution for Prediction and Causality in Econometrics and Related Topics, Studies in Computational Intelligence 983, Ha, Trung, Kreinovich and Thatch Eds. Springer 2022.
- [10] J. Harding, Decompositions in quantum mechanics — an overview, invited contribution for Quantum Computing in Econometrics, Quantum Economics and Related Topics, Studies in Systems, Decision and Control 429, 65-80. Sriboonchitta, Kreinovich and Yamaka Eds. Springer, 2022.
- [11] J. Harding and F. Lauridsen, Hyper-MacNeille completions of Heyting algebras, *Studia Logica* 109 (2021) no. 5, 1119-1157.
- [12] M. Cruz-Quinones and J. Harding, Completions of pseudo-ordered sets, *Order* 39 (2022), no. 1, 95-111.
- [13] J. Harding and A. J. Lindenhovius, Orthogeometries and AW*-algebras, to appear in *The Houston J. Math.* .
- [14] J. Harding and C. Heunen, Topos quantum theory with short posets, *Order* 38 (2021), no. 1, 111-125.
- [15] G. Bezhanishvili and J. Harding, The Fell compactification of a poset, in Statistical and Fuzzy Approaches to Data Processing with Applications to Economics and Other Areas, 31-46, Studies in Computational Intelligence series, vol. 892, 2021 .
- [16] G. Bezhanishvili, J. Harding, and M. Jibladze, Canonical extensions, free completely distributive lattices, and complete retracts, *Alg. Univer.* 82 (2021), no. 4., paper 64.
- [17] G. Bezhanishvili and J. Harding, Raney algebras and duality for T_0 -spaces, *Appl. Categ. Structures* 29 (2020), no. 6, 963-973.
- [18] J. Harding and C. Walker, A topos view of the type-2 fuzzy truth value algebra, in Algebraic Techniques and Their Use in Describing and Processing Uncertainty, 41-54, Studies in Computational Intelligence series, vol. 878, Springer, 2020.
- [19] G. Bezhanishvili, D. Gabelaia, J. Harding, and M. Jibladze, Compact Hausdorff spaces with relations and Gleason spaces, to appear in *Appl. Categorical Structures* 27 (2019), no. 6, 663-686 .
- [20] J. Harding, Modularity is not canonical, *Alg. Univ.* 80 (2019), no. 1, Paper No. 8, 4 pp.
- [21] J. Harding and C. Walker, A topos view of the type-2 fuzzy truth value algebra, in Algebraic Techniques and Their Use in Describing and Processing Uncertainty, 41-54, Studies in Computational Intelligence series, vol. 878, Springer, 2020.
- [22] G. Bezhanishvili and J. Harding, The Fell compactification of a poset, in Statistical and Fuzzy Approaches to Data Processing with Applications to Economics and Other Areas, 31-46, Studies in Computational Intelligence series, vol. 892, 2021.

- [23] J. Harding, C. Heunen, B. Lindenhovius, and M. Navara, Boolean subalgebras of orthoalgebras, *Order* 36 (2019), no. 3, 563-609.
- [24] G. Bezhanishvili, J. Harding, J. Ilin, and F. Lauridsen, MacNeille transferability and stable classes of Heyting algebras, *Alg. Univ.* 79 (2018), no. 3.
- [25] J. Harding, C. Walker and E. Walker, The convolution algebra, to appear *Alg. Univ.* 79 (2018), no. 2.
- [26] J. Harding, Dynamics in the decompositions approach to Quantum mechanics, *Internat. J. of Theoret. Phys.* 56, (2017), no. 12, 3971-3990.
- [27] J. Harding, Wigner's theorem for an infinite set, *Math. Slovaca* 68 (2018), no. 5, 1173-1222.
- [28] J. Harding and A. Romanowska, Varieties of Birkhoff systems Part I, *Order* 34 (2017), no. 1, 45-68.
- [29] J. Harding and A. Romanowska, Varieties of Birkhoff systems Part II, *Order* 34 (2017), no. 1, 69-89.
- [30] J. Harding, C. Walker, and E. Walker, *The Type-2 Truth Value Algebra*, CRC Press, 2016.
- [31] G. Bezhanishvili and J. Harding, On the proof that compact Hausdorff Boolean algebras are power sets, *Order* 33 (2016), 263-268.
- [32] G. Bezhanishvili and J. Harding, Compact Hausdorff Heyting algebras, *Algebra Universalis* 76 (2016), 301-304.
- [33] J. Harding and T. Hannan, Automorphisms of Decompositions, *Math. Slovaca* 66 (2016), no. 2, 493-526.
- [34] A. Doering and J. Harding, Abelian subalgebras and the Jordan structure of a von Neumann algebra, *The Houston J. of Math.* 42 (2016), no. 2, 559-568.
- [35] J. Harding and T. Yang, Sections in orthomodular structures of decompositions, *the Houston J. of Math.* 42 (2015) no. 4, 1079-1092.
- [36] J. Harding and T. Yang, The logic of bundles, *Internat. J. of Theoret. Phys.* 54 (2015), no. 12, 4601-4614.
- [37] J. Harding, C. Walker, and E. Walker, Partial orders on fuzzy truth value algebras, *Internat. J. of Uncertainty, Fuzziness, and Knowledge-based Systems*, 23 (2015), no. 2, 193-219.
- [38] G. Bezhanishvili, N. Bezhanishvili, and J. Harding, Modal operators on compact regular frames and de Vries algebras, *Applied Categorical Structures* 23 (2015), no. 3, 365-379.
- [39] G. Bezhanishvili, N. Bezhanishvili, and J. Harding, Modal compact Hausdorff spaces, *Journal of Logic and Computation*, 25 (2015), no. 1, 1-35.

- [40] G. Bezhanishvili and J. Harding, Stable Compactifications of frames, *Cah. Topol. Geom. Differ. Categ.* 55 (2014), no. 1, 37-65.
- [41] G. Bezhanishvili and J. Harding, Proximity frames and regularization, *Applied Categorical Structures*, 22 (2014), no. 1, 43-78.
- [42] J. Harding, C. Walker and E. Walker, Categories with fuzzy sets and relations, *Fuzzy Sets and Systems*, 256 (2014), no. 1, 149-165.
- [43] J. Harding, Daggers, kernels, Baer *-semigroups, and orthomodularity, *J. Phil. Logic* 42 (2013) no. 3, 535-549.
- [44] J. Harding, Decidability of the equational theory of the continuous geometry $CG(F)$, *J. Phil. Logic* 42 (2013), no. 3, 461-465.
- [45] J. Harding, C. Walker, and E. Walker, Type II fuzzy sets and bichains, an invited chapter for Recent Advances in Type-2 Fuzzy Sets and Systems --- Theory and Applications”, a book in the series *Studies in Fuzziness and Soft Computing* vol. 301, pg. 97-112, 2013.
- [46] J. Harding, A Boolean topological orthomodular poset, *Algebra Universalis* 68 (2012), no. 3-4, 193-196.
- [47] J. Harding, C. Walker, and E. Walker, Projective bichains, *Algebra Universalis* 67 (2012), no. 4, 347-374.
- [48] G. Bezhanishvili and J. Harding, Modal logics of Stone spaces, *Order* 29 (2012), no. 2, 271-292.
- [49] J. Harding and Qin Yang, Regular completions of lattices. *Houston J. of Mathematics* 38 (2012), no. 3., 685-691.
- [50] J. Harding and M. Navara, Subalgebras of orthomodular lattices, *Order* 28 (2011), 549-563.
- [51] J. Harding, C. Walker, and E. Walker, The variety generated by the truth value algebra of type-II fuzzy sets. *Fuzzy Sets and Systems* 161 (2010), no. 5, 735 – 749.
- [52] J. Harding, C. Walker, and E. Walker, Convex normal functions revisited. *Fuzzy Sets and Systems* 161 (2010), 1343 – 1349.
- [53] Q. Deng, J. Harding, and T. Hu, Hausdorff dimension of self-similar sets with overlaps. *Science in China Series A: Mathematics* 52 (2009), no. 1, 119 – 128.
- [54] J. Harding, A link between quantum logic and categorical quantum mechanics. *International Journal of Theoretical Physics* 48 (2009), no. 3, 769 – 802.
- [55] G. Bezhanishvili and J. Harding, The modal logic of βN . *Archive for Mathematical Logic* 48 (2009), 231 – 242.
- [56] J. Harding, κ – complete uniquely complemented lattices. *Order* 25 (2008), 121-129.

- [57] J. Harding, Completions of Ordered Algebraic Structures: A Survey, invited chapter for the Proceedings of the International Workshop on Interval/Probabilistic Uncertainty and Non-classical Logics, Ono et. al. Ed.s, *Advances in Soft Computing* vol. 46, 2008, Springer, 231 – 244.
- [58] J. Harding, C. Walker and E. Walker, Lattices of convex normal functions. *Fuzzy Sets and Systems* 159 (2008), 1061-1071.
- [59] J. Harding, A regular completion for the variety generated by the three-element Heyting algebra. *The Houston J. of Math.* 34 no. 3 (2008), 649 – 660.
- [60] J. Harding, The Source of the Orthomodular Law. Chapter for *The Handbook of Quantum Logic*, Engesser et. al. Ed.s, 555 – 586, Elsevier, 2007.
- [61] Bezhanishvili and J. Harding, MacNeille completions of modal algebras. *The Houston. J of Math.* 33 (2007), no. 2, 355 – 384.
- [62] J. Harding, Orthomodularity of decompositions in a categorical setting. *International J. of Theoretical Physics* 45 (2006), no. 6, 1117 – 1128.
- [63] M. Gehrke, J. Harding, Y. Venema, MacNeille completions and canonical extensions. *Trans. Amer. Math. Soc.* 358 (2006), no. 2, 573 – 590.
- [64] J. Harding, Profinite completions and canonical extensions. *Algebra Universalis* 55 (2006), no. 2 – 3, 293 – 296.
- [65] J. Harding, D. Smith and E. Jager, Group-valued measures on the lattice of closed subspaces of a Hilbert space. *International J. of Theoretical Physics.* 44 (2005), no. 5, 539 – 548.
- [66] G. Bezhanishvili, M. Gehrke, J. Harding, C. Walker and E. Walker, Varieties of Algebras that arise in Fuzzy Set Theory. *Logical, algebraic, analytic, and probabilistic aspects of triangular norms*, 321 – 344, Elsevier B. V., Amsterdam, 2005.
- [67] J. Harding, Remarks on concrete orthomodular lattices. *International J. of Theoretical Physics* 43 (2004), no. 10, 2149 – 2168.
- [68] G. Bezhanishvili and J. Harding, MacNeille completions of Heyting algebras. *The Houston J. of Math.* 30 (2004), no. 4, 937 – 952.
- [69] J. Harding and M. Roddy, Obituary: Günter Bruns. *Order* 20 (2004), pp. 329-332.
- [70] J. Harding, The free orthomodular lattice on countably many generators is a subalgebra of the free orthomodular lattice on three generators. *Algebra Universalis*, 48 (2) (2002), pp. 171-182.
- [71] G. Bezhanishvili and J. Harding, Functional monadic Heyting algebras. *Algebra Universalis*, 48 (1) (2002), pp. 1-10.
- [72] J. Harding and P. Ptak, On the set representations of an orthomodular poset. *Coll. Math.* 89 (2) (2001), pp. 233-240.

- [73] J. Harding, States on orthomodular posets of decompositions. *International J. of Theoretical Physics* 40 (2001), pp. 1061-1069.
- [74] M. Gehrke and J. Harding, Bounded lattice expansions. *J. of Algebra* 238 (2001), pp. 345-371.
- [75] G. Bruns and J. Harding, Algebraic aspects of orthomodular lattices, *Current Research in Operational Quantum Logic: Algebras, Categories, Languages*, B. Cooke, D. Moore and A. Wilce ed., Kluwer 2000.
- [76] J. Harding and M. Navara, Embeddings into orthomodular lattices with given centers, state spaces and automorphism groups. *Order* 17 (2000), pp. 239-254.
- [77] G. Bruns and J. Harding, Epimorphisms in certain varieties of algebras. *Order* 17 (2000), pp. 195-206.
- [78] J. Harding and A. Pogel, Every lattice with 1 and 0 is embeddable in the lattice of topologies of some set by an embedding which preserves the 1 and 0. *Topology and Its Applications* 105 (2000), pp. 99-101.
- [79] J. Harding, The axioms of an experimental system. *International J. of Theoretical Physics* 38 (6) (1999), pp. 1643-1675.
- [80] J. Harding, Regularity in quantum logic. *International J. of Theoretical Physics* 37 (4) (1998), pp. 1173-1212.
- [81] J. Harding, Canonical completions of lattices and ortholattices. *Tatra Mountains Math. Publ.* 15 (1998), pp. 85-96.
- [82] G. Bruns and J. Harding, Amalgamation of ortholattices. *Order* 14 (1998), pp. 193-209.
- [83] J. Harding, M. Marinacci, N. Nguyen, and T. Wang, Local Radon-Nikodym derivatives of set functions. *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems* 5 (3) (1997), pp. 379-394.
- [84] J. Harding and M. F. Janowitz, A bundle representation for continuous geometries. *Advances in Applied Math.* 19 (1997), pp. 282-293.
- [85] J. Harding, Decompositions in quantum logic. *The Trans. Amer. Math. Soc.* 348 (5) (1996), pp. 1839-1862.
- [86] G. D. Crown, J. Harding, and M. F. Janowitz, Boolean products of lattices. *Order* 13 (2) (1996), pp. 175-205.
- [87] J. Harding, Free central extensions. *The Houston J. of Math.* 22 (4) (1996), pp. 665-686.
- [88] J. Harding, The MacNeille completion of a uniquely complemented lattice. *The Canad. Math. Bull.* 37 (2) (1994), pp. 222-227.
- [89] J. Harding, Completions of orthomodular lattices II. *Order* 10 (1993), pp. 283-294.

- [90] J. Harding, Any lattice can be regularly embedded into the MacNeille completion of a distributive lattice. *The Houston Journal of Math.* 19 (1993), pp. 39-44.
- [91] J. Harding, Irreducible orthomodular lattices which are simple. *Algebra Universalis* 29 (1992), pp. 556-563.
- [92] J. Harding, Orthomodular lattices whose MacNeille completions are not orthomodular. *Order* 8 (1991), pp. 93-103.
- [93] J. Harding, Sheaves of orthomodular lattices and MacNeille completions. Ph.D. thesis. McMaster University, 1991.
- [94] G. Bruns, R. J. Greechie, J. Harding, and M. Roddy, Completions of orthomodular lattices. *Order* 7 (1990), pp. 67-76.
- [95] J. Harding, Boolean factors of orthomodular lattices. *Algebra Universalis* 25 (1988), pp. 281-282.
- [96] J. Harding, Varieties of ortholattices containing the orthomodular lattices. M.Sc. thesis. McMaster University, 1988

Conference and colloquium talks:

J. Harding, Subalgebras of OMLs, talk at the International Quantum Structures Association conference, Brussels, July 2024.

J. Harding, Subalgebras of OMLs, colloquium talk at UTEP, April 2024.

J. Harding and A. Kornell, Completely hereditarily atomic OMLs, series of talks at SSAOS, Stara Lesna Slovakia, Sept. 2023.

J. Harding and A. Kornell, Completely hereditarily atomic OMLs, colloquium talk at Czech Technical University, Prague, August 2023.

J. Harding, Quantum monadic algebras, talk at AMS Sectional Meeting, UTEP, Sept. 2022.

J. Harding, Quantum monadic algebras, talk at BLAST, Chapman University, August 2022.

J. Harding, Quantum monadic algebras, colloquium talk at the ILLC, Amsterdam, June 2022.

J. Harding, Quantum monadic algebras, talk at the AMS Sectional Meeting, Denver May 2022.

J. Harding, Decompositions in quantum mechanics --- An overview, The Thailand Econometric Society, January 2022.

J. Harding, Logical aspects of quantum structures, ECONVN (virtual), January 2022.

J. Harding, Convolution algebras, invited talk at the inaugural meeting of the Malaysian Logic Society (virtual), October 2021.

J. Harding, The decompositions approach to quantum mechanics, LQCAI (virtual), July 2021.

J. Harding, Free completely distributive extensions, ILLC workshop (virtual), July 2021.

J. Harding, Canonical completions, Colloquium talk (virtual), Warsaw, March 2021.

J. Harding, Luders rule and conditional probability in quantum mechanics, invited talk at EconVn (electronic) Hanoi, January 2021.

J. Harding, Canonical extensions and free completely distributive lattices, Colloquium talk (electronic) Chennai, Fall 2020.

J. Harding and F. Lauridsen, Hyper-MacNeille completions of Heyting Algebras, TACL, Nice, 2019 (presented by Lauridsen).

J. Harding, Decompositions in quantum logic, Invited talk ARL workshop on Higher Category Approach to Certifiably Correct Quantum Information Processing Systems, Washington DC, Feb 2019.

J. Harding, Boolean subalgebras of orthoalgebras, SYSMICS, Orange CA, September 2018.

J. Harding, Boolean subalgebras of orthoalgebras, BLAST, Denver, August 2018.

J. Harding, Boolean subalgebras of orthoalgebras, QPL, Halifax, June 2018.

J. Harding, Lattice theory, a week of lectures at ESSLLI, Toulouse, July 2017.

J. Harding, The convolution algebra, TACL, Prague, June 2017.

J. Harding, An operational view of Schroedinger's equation, IQSA meeting, Nijmegen, July 2017.

J. Harding, "The Type-2 truth value algebra", AMS meeting, Denver, September 2016.

J. Harding, "Automorphisms of decompositions", IQSA meeting, Leicester, July 2016.

J. Harding, "The Type-2 truth value algebra", Quantum workshop, Amsterdam, September 2015.

J. Harding, "Products or sums", Quantum workshop, Amsterdam, May 2015.

J. Harding, "Quantum structures", colloquium, Ames IA, September 2014.

J. Harding, "Topological Boolean algebras", seminar talk, Ames IA, September 2014.

J. Harding, "Orthomodular structures of decompositions", invited talk, IQSA meeting, Olomouc, Czech Republic, June 2014.

J. Harding, "Projective bichains", BLAST meeting, Orange CA, July 2013.

J. Harding, "Automorphisms of decompositions", AMS sectional meeting, Boulder CO, April 2013.

- J. Harding, "Type-2 Fuzzy Sets", AMS Sectional Meeting, Akron OH, October 2012.
- J. Harding, "Modal Compact Hausdorff Spaces", Duality Workshop, Oxford UK, June 2012.
- J. Harding, "Proximities --- A Survey", colloquium UTEP, El Paso TX, November 2011.
- J. Harding, "Proximity Frames", invited talk at BLAST, Lawrence KS, June 2011.
- J. Harding, "Modal logics, von Neumann algebras, and bichains", colloquium talk at Imperial College, London, March 2011.
- J. Harding, "Subalgebras of orthomodular lattices", colloquium talk at Chapman University, Los Angeles, November 2010.
- J. Harding, "Orthomodular structures and categories, or, everything old is new again", talk at the Internat. Quantum Structures biennial conference, Boston, June 2010.
- J. Harding, "Daggers, kernels, Foulis semigroups, and orthomodularity", invited talk at the session on Quantum Computing at the Association for Symbolic Logic Annual meeting, Washington D.C., March 2010.
- J. Harding, "The logic of Stone spaces", talk at the NMSU-UTEP workshop, Nov. 7, 2009.
- J. Harding, "Completions of ordered algebraic structures", Colloquium at UTEP, Nov. 6, 2009.
- J. Harding, "Orthomodularity and decompositions", invited talk at the workshop Quantum Logic Inspired by Quantum Computation, Indiana University, May 11 – 12, 2009.
- J. Harding, "A link between quantum logic and categorical quantum mechanics", talk at the conference Quantum Physics and Logic (QPL VI), Oxford University, April 8 – 9, 2009.
- J. Harding, A link between quantum logic and categorical quantum mechanics, talk at the NMSU/UTEP workshop November 2008.
- J. Harding, Orthomodularity in dagger byproduct categories, talk at the BLAST conference, Denver, August 2008.
- J. Harding, Three open problems in lattice theory, talk at the NMSU/UTEP workshop April 2008.
- J. Harding, Completions of ordered algebraic structures --- a survey, invited talk for the International Workshop on Interval/Probabilistic Uncertainty and Non-Classical Logics (UncLog'08), Ishikawa, Japan, March 2008.
- J. Harding, Some quantum logic and a few categories, invited talk for the Categorical Quantum Logic Workshop, Oxford, August 2007.
- J. Harding, Completions and a variety of Heyting algebras, contributed plenary talk at the International Conference on Order, Algebra and Logics, Vanderbilt, June, 2007.

J. Harding, Completions of Ordered Structures, talk at the Department of Computer Science, University of Leicester, July 2006.

G. Bezhanishvili and J. Harding, MacNeille completions of modal algebras, talk at the conference: Algebraic and Topological methods in non-classical Logics II, Barcelona, June 2005.

J. Harding, Canonic and MacNeille completions, talk at the Walter Taylor conference, Boulder, August 2004.

J. Harding, Concrete orthomodular lattices, talk at the International Quantum Structures Association conference, Denver, 2004.

J. Harding, Decompositions and orthomodular structures, talk at the conference Philosophical Logic meets Mathematical Logic: From Classical to Quantum, Brussels, February 2004.

J. Harding, Canonical completions and orthomodular structures. Talk at the ILLC, University of Amsterdam, September 2003.

J. Harding, Canonical completions. Talk at Oxford University, September 2003.

J. Harding, Canonic and MacNeille Completions. Invited talk at the International Conference on Algebraic and Topological Methods in Non-Classical Logics, Tbilisi Georgia, June 2003.

J. Harding, Canonical completions. Talk at the University of Denver, February 2003.

J. Harding, Decompositions. American Mathematical Society Annual Meeting, Baltimore, January 2003.

J. Harding, Canonical Extensions. International Quantum Structures Association conference, Vienna, July 2002.

G. Bezhanishvili and J. Harding, Monadic Heyting Algebras. Association of Symbolic Logic annual meeting, Las Vegas, June 2002.

J. Harding, Functional Monadic Heyting Algebras. American Mathematical Society sectional meeting, Atlanta, March 2002.

J. Harding, Free Orthomodular Lattices. Invited talk at the International Quantum Structures Association Conference, Cesenatico Italy, March 2001.

J. Harding, Orthomodular Lattices. Talk at the Thomasina Coverly Memorial Workshop on Ordered Sets and Universal Algebra. Vanderbilt University, Nashville, May 2000.

J. Harding, Boolean algebras of decompositions. Talk at the Free University of Brussels, Brussels, June 1999.

J. Harding, Canonical extensions of lattices with additional operations. New Mexico State University Holiday Symposium, Las Cruces, NM, January 1999.

- J. Harding, Completing and finitely completing orthostructures. International Quantum Structures Association Conference, Liptovsky Jan, Slovakia, September 1998.
- J. Harding, The axioms of an experimental system. Talk at the Free University of Brussels, Brussels, June 1998.
- J. Harding, The axioms of an experimental system. Talk at the Faculty of Electrical Engineering, Czech Technical University, Prague, May 1998.
- J. Harding, The axioms of an experimental system. Talk at the Institute of Physics, Vienna Institute of Technology, Vienna, May 1998.
- J. Harding, The axioms of an experimental system. Talk at the ElectroTechnical Faculty of the Slovak Technical University, Bratislava, May 1998.
- J. Harding, Regularity in quantum logic. International Quantum Structures Conference, Atlanta, October 1997.
- J. Harding, M. Marinacci, N. Nguyen, and T. Wang, Local Radon-Nikodym derivatives of set functions. MAA meeting, Grants NM, April 1997.
- J. Harding and M. Janowitz, A bundle representation for continuous geometries. International Quantum Structures Association Conference, Berlin, August 1996.
- G. Bruns and J. Harding, Amalgamation in Varieties of Ortholattices. International Quantum Structures Association Conference, Berlin, August 1996.
- J. Harding, Recent Results and Open Problems in the Theory of Orthomodular Lattices. Talk at the Czech Technical University, Prague, July 1996.
- J. Harding, Decompositions in Quantum Logic. International Conference on Modern Algebra and Its Applications, Nashville TN, May 1996.
- J. Harding, Decompositions in quantum logic. International Quantum Structures Association conference, Prague, Czech Republic, Aug. 1994.
- J. Harding, Uniquely complemented lattices. Colloquium talk at the University of Manitoba, Winnipeg, Manitoba, Feb. 1994.
- J. Harding, Completions of orthomodular lattices. The Third Winter School on Measure Theory, Liptovsky Jan, Checkoslovakia, Jan. 1993.
- J. Harding, Modal algebras and orthomodular lattices. The Alan Day Conference, Hamilton, Ontario, Aug. 1992.
- J. Harding, MacNeille completions of orthomodular lattices. The Birkhoff Symposium, Darmstadt, Germany, May 1991.
- J. Harding, Sheaves of orthomodular lattices. Colloquium talk at SUNY at New Paltz NY, Sept. 1990.

J. Harding, A construction of orthomodular lattices. American Mathematical Society meeting, Manhattan KA, March 1990.