MASAHIKO SAITO

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POSITIONS HELD

University of South Florida	Professor	2007 Fall - Present
University of South Florida	Associate Professor	2001 Fall - 2007 Spring
University of South Florida	Assistant Professor	1995 Fall - 2001 Spring
Northwestern University	Visiting Assistant Professor	1994 Fall - 1995 Spring
University of Texas at Austin	Lecturer / Postdoctoral Fellow	1992 Spring - 1994 Spring
University of Toronto	Postdoctoral Fellow	1991 Spring - 1991 Fall
University of Texas at Austin	Postdoctoral Fellow	1990 Fall

EDUCATION

Ph.D.	Mathematics	University of Texas at Austin	1990
M.S.	Mathematics	University of Tokyo	1984
B.S.	Mathematics	University of Tokyo	1982

RESEARCH AREAS

Knot theory, low dimensional manifolds, geometric topology, related algebraic structures, and applications to DNA recombination.

PUBLICATIONS

Research Monographs:

1. *Surfaces in* 4*-space,* (with J.S. Carter and S. Kamada), Encyclopedia of Mathematical Sciences, vol. 142, Springer-Verlag, 2004.
2. *Knotted Surfaces and Their Diagrams,* (with J.S. Carter), Methematical surveys and monographs, vol. 55, the American Mathematical Society, 1998.
3. *Classical and Quantum 6j Symbols,* (with J.S. Carter and D.E. Flath), Mathematical notes, vol. 43, Princeton University Press, 1995.

Articles published in refereed journals or refereed proceedings:

1. *Homology for quandles with partial group operations,* with J.S. Carter, A. Ishii, K. Tanaka, Pacific J. of Math. 287-1 (2017) 19–48.
2. *Algebraic properties of quandle extensions and values of cocycle knot invariants,* with W. Edwin Clark, J. Knot Theory Ramifications, 25 (2016) 1650080, 17pp.
3. *Recurring patterns among scrambled genes in the encrypted genome of the ciliate Oxytricha trifallax,* with J. Burns, D. Kukushkin, X. Chen, L.F. Landweber, N. Jonoska, Journal of Theoretical Biology, 410 (2016) 171–180.
4. *Quandle coloring and cocycle Invariants of composite knots and abelian extensions*, with W.E. Clark, L. Vendramine, J. Knot Theory Ramifications, 25 (2016) 1650024, 34pp.
5. *Genus ranges of* 4*-regular rigid vertex graphs,* with D. Buck, E. Dolzhenko, N. Jonoska, K. Valencia, Electronic Journal of Combinatorics 22(3) (2015) #P3.43.

6. *Genus ranges of chord diagrams,* with J. Burns, N. Jonoska, J. Knot Theory Ramifications, 24 (2015) 1550022, 15 pp.
7. *Quandle colorings of knots and applications,* with W.E. Clark, M. Elhamdadi, T. Yeatman, J. Knot Theory Ramifications, 23 (2014) 1450035, 29 pp.
8. *Connected quandles associated with pointed abelian groups,* with W.E. Clark, M. Elhamdadi, X-D. Hou, T. Yeatman, Pacific J. Math. 264 (2013), 31–60.
9. *Four-regular graphs with rigid vertices associated to DNA recombination,* with J. Burns, E. Dolzhenko, N. Jonoska, T. Muche, Discrete Applied Mathematics 161 (2013), 1378–1394.
10. *Rewriting rule chains modeling DNA rearrangement pathways,* with A. Angeleska and N. Jonoska, Theoretical Computer Science (2012), online: http://dx.doi.org/10.1016/j.tcs.2012.04.041.
11. *Algebraic structures derived from foam*, with J. S. Carter, Journal of Generalized Lie Theory and Applications, Vol. 5 (2011), Article ID G100202, 9 pp, doi:10.4303/jglta/G100202.
12. *DNA rearrangements through spatial graphs,* with N. Jonoska, Programs, proofs, processes, Lecture Notes in Comput. Sci., 6158, Springer, Berlin, 2010, 211–218.
13. *The minimum number of Fox colorings and quandle cocycle invariants,* Journal of Knot Theory and Its Ramifications, 19 (2010), 1449–1456.
14. *Symmetric extensions of dihedral quandles and triple points of non-orientable surfaces,* with J. S. Carter and K. Oshiro, Topology and its appl. 157 (2010), 857–869.
15. *Template guided DNA recombination model via spatial graphs,* with A. Angeleska, N.Jonoska, L.F. Landweber, "Algorithmic Bioprocesses" (A. Condon et al. Eds), Springer-Verlag (2009), 83–98.
16. *Virtual knot invariants from Group biquandles and their Cocycles,* with J.S. Carter, M. Elhamdadi, D. Silver, S. Williams, Journal of Knot Theory and Its Ramifications, 18 (7), (2009), 957–972.
17. *DNA recombinations through assembly graphs,* with A. Angeleska and N. Jonoska, Discrete Applied Mathematics 157 (2009), 3020–3037.
18. *Strategies for RNA-guided DNA Recombination,* with A. Angeleska, N. Jonoska, L.F. Landweber, Algorithmic Bioprocesses (eds. Joost N. Kok et al.) (2009).
19. *Polynomial cocycles of Alexander quandles and applications*, with K. Ameur, Journal of Knot Theory and Its Ramifications, Vol. 18, No. 2 (2009) 151–165.
20. *Tangle embeddings and quandle cocycle invariants,* with K. Ameur, M. Elhamdadi, T. Rose, C. Smudde, Experiment. Math. 17 (2008), no. 4, 487–497.
21. *Cohomology of Frobenius Algebras and the Yang-Baxter Equation,* with J. S. Carter, A.S. Crans, M. Elhamdadi, E. Karadayi, Communications in Contemporary Mathematics 10, Suppl. 1 (2008) 791–814.
22. *Cohomology of categorical self-distributivity,* with J. S. Carter, A.S. Crans, M. Elhamdadi, J. Homotopy Relat. Struct. 3 (2008), no. 1, 13–63.
23. *Cohomology of the adjoint of Hopf algebras,* with J. S. Carter, A.S. Crans, M. Elhamdadi, J. Gen. Lie Theory Appl. 2 (2008), no. 1, 19–34.
24. *Sampling large random knots in a confined space,* with J. Arsuaga, T. Blackstone, Y. Diao, K. Hinson, and E. Karadayi, J. Phys. A: Math. Theor. 40 (2007), 11697–11711.
25. *RNA-guided DNA assembly*, with A. Angeleska, N. Jonoska, and L.F. Landweber, J. Theoretical Biology 248 (2007), 706–720.
26. *Linking of uniform random polygons in confined spaces,* with J. Arsuaga, T. Blackstone, Y. Diao, and E. Karadayi, J. Phys. A: Math. Theor. 40 (2007), 1925–1936.
27. *Cohomology for self-distributivity in coalgebras,* with J. S. Carter, in *Intelligence of Low Dimensional Topology 2006*, Series on knots and everything **40** World Scientific Publishing (2007), 9–18.
28. *Ribbon concordance of surface-knots via quandle cocycle invariants,* with J.S. Carter and S. Satoh, J. Aust. Math. Soc. 80 (2006), no. 1, 131–147.
29. *Set-theoretic Yang-Baxter solutions via Fox calculus*, with J.S. Carter, Journal of Knot Theory and Its Ramifications, Vol. 15, No. 8 (2006) 949–956.
30. *A lower bound for the number of Reidemeister moves of type III*, with J.S. Carter, M. Elhamdadi and S. Satoh, Topology and its Applications, 153 (2006), 2788–2794.

31. *Ribbon-moves for 2-knots with 1-handles attached and Khovanov-Jacobsson numbers*, with J.S. Carter and S. Satoh, Proc. Amer. Math. Soc. 134 (2006) 2779–2783.
32. *The spun trefoil needs four broken sheets*, with S. Satoh, Journal of Knot Theory and its ramifications Vol. 14, No. 7 (2005), 853–858.
33. *Cocycle knot invariants from quandle modules and generalized quandle homology*, with J.S. Carter, M. Elhamdadi and M. Grana, Osaka J. Math. 42 (2005), no. 3, 499–541.
34. *Homology theory for the set-theoretic YangBaxter equation and knot invariants from generalizations of quandles*, with J.S. Carter and M. Elhamdadi, Fund. Math. 184 (2004), 31–54.
35. *Algebraic and topological models for DNA recombinant processes,* with N. Jonoska, Proceedings of Developments in Language Theory: 8th International Conference, DLT 2004. Auckland, New Zealand, December 13-17, Lecture Notes in Computer Science, Springer-Verlag Heidelberg, vol. 3340 (2004), 49–62.
36. *Quantum invariants of templates,* with L.H. Kauffman and M.C. Sullivan, Journal of Knot Theory and Its Ramifications, Vol. 12, No. 5 (2003) 653–681.
37. *Extensions of quandles and cocycle knot invariants,* with J.S. Carter, M. Elhamdadi and M. A. Nikiforou, Journal of Knot Theory and Its Ramifications, Vol. 12, No. 6 (2003) 725–738.
38. *Quandle cohomology and state-sum invariants of knotted curves and surfaces,* with J.S. Carter, D. Jelsovsky, L. Langford, and S. Kamada, Trans. Amer. Math. Soc. 355 (2003), no. 10, 3947–3989.
39. *Quandle homology theory and cocycle knot invariants,* with J.S. Carter, Topology and geometry of manifolds, 2001 Georgia International Topology Conference, Proc. Symposia in Pure Math., vol. 71, eds. Matic and McCrory, (2003) 249–268.
40. *Diagrammatic computations for quandles and cocycle knot invariants,* with J.S. Carter and S. Kamada, Contemporary Math., vol. 318, Amer. Math. Soc., a conference proceedings on "Diagrammatic morphisms and applications," 51–74.
41. *Bordism of unoriented surfaces in* 4*-space,* with J.S. Carter, S. Satoh, and S. Kamada, Michigan Math. J. vol. 50 (2002), 575–591.
42. *Twisted quandle homology theory and cocycle knot invariants,* with J.S. Carter and M. Elhamdadi, Algebraic and Geometric Topology, vol. 2, (2002) 95–135.
43. *Stable Equivalence of Knots on Surfaces and Virtual Knot Cobordisms,* with J.S. Carter and S. Kamada, J. Knot Theory Ramifications, 11 (2002) 311–322.
44. *Boundary components of thickened graphs,* with N. Jonoska, Proceedings of DNA7, LNCS 2340, Springer-Verlag, (2002) 70–81.
45. *Singularities of the projections of surfaces in 4-space,* with J.S. Carter and V. Carrara, Pacific J. Math. 199 (2001), 21–40.
46. *A theorem of Sanderson on link bordisms in dimension 4,* with J.S. Carter, S. Kamada and S. Satoh, Algebraic and Geometric Topology, vol. 1, (2001), 299–310.
47. *Shifting Homomorphisms in Quandle Cohomology and Skeins of Cocycle Knot Invariants,* with J.S. Carter, D. Jelsovsky, and S. Kamada, Journal of Knot Theiry and its Ramifications, 10 (2001), no. 4, 579–596.
48. *Computations of quandle cocycle invariants of knotted curves and surfaces,* with J.S. Carter, D. Jelsovsky, and S. Kamada, Advances in math., 157 (2001) 36–94.
49. *Quandle homology groups, their betti numbers, and virtual knots,* with J.S. Carter, D. Jelsovsky, and S. Kamada, Journal of Pure and Applied Algebra, 157, Issues 2-3, (2001) 135–155.
50. *Geometric interpretations of quandle homology,* with J.S. Carter and S. Kamada, Journal of knot theory and its ramifications, Vol.10, No.3 (2001) 345–386.
51. *Alexander numbering of knotted surface diagrams,* with J.S. Carter and S. Kamada, Proc. A.M.S. 128 (2000), no. 12, 3761-3771.
52. *State-sum invariants for knotted curves and surfaces from quandle cohomology,* with J.S. Carter, D. Jelsovsky, L. Langford, and S. Kamada, Electronic Research Announcement of the AMS, vol. 5 (1999) 146–156.

53. *Three dimensional DNA structures in computing,* with N. Jonoska and S. Karl, BioSystems 52 (1999) 143–153.
54. *Structures and diagrammatics of four-dimensional topological lattice field theories,* with J.S.Carter, and L.H. Kauffman, Advances in Math., 146 (1999) no.1, 39–100.
55. *Hidden Stasheff Polytopes in Algebraic K-Theory and in the Space of Morse Functions,* with M.M. Kapranov, Contemporary Math. (AMS) 227 (1999) 191–225.
56. *Creating* 3*-dimensional Graph Structures with DNA,* with N. Jonoska and S.A. Karl, Proceedings of 3rd DIMACS workshop on DNA based computers, DNA based computers III, eds. Rubin and Wood, DIMACS series in discrete mathematics and theoretical computer science, vol. 48, AMS 1997, 123–135.
57. *Diagrammatics, Singularities, and Their Algebraic Interpretations,* with J.S. Carter and L.H. Kauffman, 10th Brazilian Topology Meeting (So Carlos, 1996), matematica contemporanea, vol 13, (1997), 21-115.
58. *Surfaces in* 3*-Space That Do Not Lift to Embeddings in* 4*-Space,* with J.S. Carter, Knot theory (Warsaw, 1995), 29-47, Banach Center Publ., 42, Polish Acad. Sci., Warsaw, 1998.
59. *A Combinatorial Description of Knotted Surfaces and Their Isotopies,* with J.S. Carter and J.H. Rieger, Advances in Mathematics, 127, No. 1, April 15 (1997), 1–51.
60. *On Finiteness of Certain Vassiliev Invariants,* with L.H. Kauffman and S.F. Sawin, Journal of Knot Theory and its Ramifications, 6 (1997), 291-297.
61. *Normal Euler Classes of Knotted Surfaces and Triple Points on Their Projections,* with J.S. Carter, Proc. AMS. 125 (1997) no.2, 617–623.
62. *A Seifert Algorithm for Knotted Surfaces,* with J.S. Carter, Topology, vol. 36, No. 1 (1997) 179–201.
63. *Braids and Movies,* with J.S. Carter, Journal of Knot Theory and its Ramifications, Vol. 5, No. 5 (1996) 589-608.
64. *On Formulations and Solutions of Simplex Equations,* with J.S. Carter, Intern. J. of Mod. Phys. A., Vol. 11, No. 24 (1996) 4453–4463.
65. *Knot Diagrams and Braid Theories in Dimension 4,* with J.S. Carter, in the conference proceedings *Real and Complex Singularities*, ed. W. Marar, Longman, (1995) 112–147.
66. *Knotted Surfaces, Braid Movies and Beyond,* with J.S. Carter, in *Knots and Quantum Gravity* , ed. J. Baez, Oxford U. Press, (1994) 191-229.
67. *Some New Solutions to the Permutohedron Equation,* with J.S. Carter, in *Proceedings of the Conference on Quantum Topology* (D.N. Yetter, ed.), World Scientific (1994) 51–66.
68. *A Diagrammatic Theory of Knotted Surfaces*, with J.S. Carter, in *Quantum Topology*, eds. R. A. Baadhio and L. H. Kauffman, World Scientific, (1993) 91-115.
69. *Reidemeister Moves for Surface Isotopies and Their Interpretations as Moves to Movies*, with J.S. Carter, J. of Knot Theory and its Ramifications, vol 2, no 3, (1993), 251–284.
70. *On the Unoriented Sato-Levine Invariant*, J. of Knot Theory and its Ramifications, vol 2, no 3, (1993), 335–358.
71. *Planar Generalizations of the Yang-Baxter Equation and Their Skeins*, with J. S. Carter, Journal of Knot Theory and its Ramifications, vol. 1, no. 2, (1992) 207–217.
72. *Canceling Branch Points on the Projections of Surfaces in 4-space*, with J.S. Carter, Proc. A.M.S. 116, 1, (1992) 229-237.
73. *Syzygies among Elementary String Interactions in 2+1 Dimensions*, with J.S. Carter, Letters in Math. Physics, 23, (1991) 287–300.
74. *On Closed Orbits of Morse-Smale Flows on 3-manifolds*, Bull. London Math. Soc, 23 (1991), 482–486.
75. *A Note on Cobordism of Surface Links in* S^4, Proc. A.M.S. 111 (3) (1991), 883–887.
76. *Minimal Number of Saddle Points of Properly Embedded Surfaces in the 4-ball*, Mathematics Seminar Notes Kobe Univ. 11 (1983) 345–348.

Book co-edited:

Discrete and Topological Models in Molecular Biology, Eds. N. Jonoska, M. Saito, Natural Computing book series, Springer, 2014.

Book co-translated:

Matsumoto, Yukio, *An introduction to Morse theory,* Translated from the 1997 Japanese original by Kiki Hudson and Masahico Saito, Translations of Mathematical Monographs 208, (from: Iwanami Series in Modern Mathematics), American Mathematical Society, Providence, RI, 2002.

Websites for research:

1. "Quandle cocycle knot invariants", http://shell.cas.usf.edu/quandle/
2. "Quandle colorings and invariants of knots in the table," http://shell.cas.usf.edu/∼saito/BridgeIndex/
3. "Graphs for DNA assembly", http://shell.cas.usf.edu/∼saito/DNAweb/

ADDRESSES

1. "Knot colorings by quandles and their animations," Knots in Washington XLIII, conference honoring J. Scott Carter on his 60th birthday, George Washington University, December 9–11, 2016.
2. "Rotations of spherical polygons and quandle cocycle invariants," AMS Meeting #1124, Raleigh, North Carolina, November 12–13, 2016.
3. "Topological quandles and cocycle knot invariants," International Conference on Knots, Low Dimensional Topology and Applications: Knots in Hellas 2016, International Olympic Academy (IOA), Ancient Olympia, Greece, July 17–23, 2016.
4. "Cocycle knot invariants with topological quandles," Knots in The Triangle, North Carolina State University, Raleigh, NC, April 29 - May 1, 2016.
5. "Sequences of quandles and cocycle knot invariants," Conference on Advances in Quantum and Low-Dimensional Topology, University of Iowa, March 11–13, 2016.
6. "Quandle identities and homology," AMS Meeting # 1117, University of Georgia, Athens, GA, March 5–6, 2016.
7. "Sequences of quandle extensions and cocycle knot invariants," Joint AMS-MAA Meeting, Seattle, WA, January 6–9, 2016.
8. "Coloring knot diagrams," Math Colloquium, Dartmouth College, November 12, 2015.
9. "Rack relations and homology," AMS Meeting # 1114, California State University at Fullerton, Fullerton, CA, October 24–25, 2015.
10. "Homology for quandles with partial group operations," AMS Meeting #1112, Loyola University Chicago, Chicago, IL, October 3–4, 2015.
11. "Properties of four-valent rigid vertex graphs motivated from DNA assembly," N-KOOK Seminar, Osaka, Japan, June 20, 2015.
12. "Homology for quandles with partial group operations," Osaka City University, Friday Topology Seminar, June 19, 2015.
13. "Triangular surfaces with Latin quandle actions," AMS meeting #1107, Washington, DC, March 7–8, 2015.
14. "Group-quandle homology," Conference on Knot Theory and Its Application to Physics and Quantum Computing, UT Dallas, Richardson TX, January 6-9, 2015.
15. "Notes on quandle invariants of knots and extensions," Conference: Prospects in Topology of Manifolds, University of Tokyo, November 28–30, 2014.
16. "Quandle knot invariants and applications," Tuesday seminar on topology, University of Tokyo, November 25, 2014.
17. "Quandle invariants of composite knots and extensions," AMS Meeting # 1105, Greensboro, NC, November 8–9, 2014.
18. "Modeling DNA assembly by 4-regular rigid vertex graphs," AMS Meeting # 1098, University of Maryland Baltimore County, March 29–30, 2014.
19. "Homology for quandles with partial group operations," AMS-MAA Joint Meeting, # 1096, Baltimore, MD, January 15–18, 2014.

20. "Genus ranges of 4-regular rigid vertex graphs," Lloyd Roeling Mathematics Conference, University of Louisiana at Lafayette , November 8–10, 2013.
21. "Some aspects of quandle colorings for knots and applications," AMS Meeting # 1095, University of California Riverside, November 2–3, 2013.
22. "Towards unifying group and quandle homology theories," Knots in Washington XXXVI, plenary talk, George Washington University, Washington, DC, May 3–5, 2013.
23. "Genus ranges of 4-regular rigid vertex graphs," Mathematics of Knots V, Waseda University, Tokyo, Japan, December 23–26, 2012.
24. "Genus ranges of 4-regular rigid vertex graphs," Knots in Washington XXXV, George Washington University, Washington, DC, December 7–9, 2012.
25. "Models for DNA assembly by 4-regular rigid vertex graphs," Workshop on Knot Theory and Related Topics, Pusan National University, Korea, July 23–27, 2012.
26. "On a family of extension quandles associated with pointed abelian groups," AMS Meeting # 1081, University of Kansas, Lawrence, KS, March 30 – April 1, 2012.
27. "Connected quandles associated with pointed abelian groups," AMS Meeting # 1080, George Washington University, Washington, DC, March 17–18, 2012.
28. "Spatial graphs with 4-rigid vertices and DNA assembly of ciliates," Knots in Washington XXXIII, George Washington University, Washington, DC, December 2–4, 2011.
29. "Template guided DNA recombination model via spatial graphs," AMS Meeting # 1073 at Winston-Salem, NC, September 24–25, 2011.
30. "Knot invariants from categorical quandles and Alexander modules," Knots in Washington XXXI, George Washington University, Washington, DC, December 3–5, 2010.
31. "Categorical quandles and knots II – the fundamental 2-quandle and colorings," AMS meeting # 1063 at UCLA, Special session on algebraic structures in knot theory, October 9–10, 2010.
32. "Knot invariants from categorical fundamental quandles," Knots in Washington XXX, George Washington University, Washington, DC, May 19–21, 2010.
33. "Algebraic structures derived from essential surfaces and foams," Conference on "Mathematics of Knots II," Waseda University, Tokyo, Japan, December 23–26, 2009.
34. "Algebraic structures derived from foams and TQFTs," Knots in Washington XXIX, George Washington University, Washington, DC, December 4–6, 2009.
35. "Quandle cohomology and cocycle knot invariants with inner automorphism actions," AMS meeting #1054 at UC Riverside, Special session on algebraic structures in knot theory, Riverside, CA, November 7–8, 2009.
36. "Algebraic structures derived from foams," AMS meeting #1053 at Florida Atlantic University, Special session on invariants of knots and links, Boca Raton, FL, October 30 – November 1, 2009.
37. "Frobenius modules and essential surface cobordisms," at: Advanced School and Conference on Knot Theory and its Applications to Physics and Biology, ICTP, Trieste, Italy, May 25–29, 2009.
38. "Frobenius modules and essential surface cobordisms," Knots in Washington XXVII, George Washington University, Washington, DC, January 9–11, 2009.
39. "Knot theoretical methods for RNA-template guided DNA recombinations," Joint AMS-MAA meeting, AMS Special session on topological methods in applied mathematics, January 5–8, 2009.
40. "Cocycle deformations of R-matrices and applications to knots," International Conference on Algebraic and Geometric Topology, University of Gdansk, Poland, June 9–13, 2008.
41. "Cohomology Theories of Frobenius Algebras and Applications," Oberwolfach Workshop: Invariants in Low-Dimensional Topology, Oberwolfach, Germany, May 4–10, 2008.
42. "On higher order relations of nested arcs,," Knots in Washington XXVI, George Washington University, Washington, DC, April 18–20, 2008.
43. "The Minimal Number of Fox Colors and Quandle Cocycle Invariants of Knots," AMS meeting # 1037 at LSU, Special Session on Recent Advances in Knot Theory: Quandle Theory and Categorified Knot Invariants, March 28–30, 2008.

44. "Cohomology for Frobenius algebras and applications," Workshop on knots and quantum computing, University of Texas at Dallas, December 18–20, 2007.
45. "Cohomology theories of algebraic systems via graph diagrams and applications to knots," Joint AMS-PTM meeting, Warsaw, Poland, July 31 – August 3, 2007.
46. "Cohomology for Frobenius algebras and applications," Knots in Washington XXIV in memory of Xiao-Song Lin, April 13–15, 2007.
47. "Relations among algebraic cohomology theories and applications," AMS Meeting # 1025, Special Session on Quantum Topology, Miami University, Oxford, OH, March 16–17, 2007.
48. "Applications, constructions, and interpretations of quandle cocycles," plenary speaker, Knots in Washington XXIII, Quandles- their homology and ramifications, George Washington University, Washington, DC, November 17–19 , 2006.
49. "Cohomology of categorical self-distributivity," (a plenary talk listed with J.S. Carter), International conference on topology: "Intelligence of low dimensional topology," Hiroshima University, Japan, July 22 – July 26, 2006.
50. "Some new developments in quandle cohomology theory - computations, applications and quandles in tensor categories," The 22nd Conference on Knot Theory and its Ramifications, George Washington University, Washington, DC, May 5-7, 2006.
51. "Quandle cocycle invariants and tangle embeddings," Topology of Knots VIII, Waseda University, Tokyo, Japan, Dec. 23-26, 2005.
52. "Constructions and applications of quandle cocycle invariants of knots, graphs, and surfaces," Quantum Topology – Contemporary issues and perspectives, Snowbird, Utah, June 5-9, 2005.
53. "Applications of quandle cocycle invariants to knots and graphs," AMS Meeting # 1006, Special Session on Invariants of Links and 3-Manifolds, Texas Tech University, Lubbock, TX, April 8-10, 2005.
54. "Set-theoretic Yang-Baxter solutions via Fox calculus," Port City Topology Conference, University of South Alabama Mobile, AL, February 26-27, 2005.
55. "A lower bound of Reidemeister type III moves from Fox colorings," Knots in Washington XX, Washington D.C., Feb. 11-13, 2005.
56. "Cocycle invariants of knots, graphs, and surfaces," Toward the future of the topology of manifolds, conference in honor of Yukio Matsumoto's sixtieth birthday, Nov. 8-11, 2004, University of Tokyo, Japan.
57. "Quandle homology theories, set-theoretic Yang-Baxter equations, and topological applications," The first international KOOK seminar, Awaji island, Japan, July 9-13, 2004.
58. "Mysteries of polynomials in quandle colorings of knots," at a mini-conference on 2-knots, March 10-11, 2004, at University of South Alabama, Mobile, AL.
59. "Generalizations of quandle cocycle invariants and Alexander modules from quandle modules," AMS #110 annual (joint AMS-MAA) meeting, special session on "Low dimensional topology," Phoenix, AZ, Jan. 7-11, 2004.
60. "Variations of quandle cocycle invariants for knots and applications," at Borders in 3-dimensional topology, Ohio State U., Dec. 5-7, 2003.
61. "Quandle homology theories and cocycle invariants of knots and knotted surfaces," talk given at the Osaka-City Univ. advanced mathematical institute on Nov. 21, 2003.
62. "Generalizations of quandle cocycle invariants and Alexander modules from quandle modules," talk given at the conference: "Intelligence of Low-dimensional Topology," Shodo-shima, Japan, Nov. 18-20, 2003.
63. "Ribbon concordance and triple point numbers of knotted surfaces and quandle cocycle invariants," Knots in Poland 2003, Banach Center, Warsaw, Poland, July, 2003.
64. "Braids, quandle extensions, and cocycle knot invariants," AMS meeting, special session on "Algebraic topology based on knots," Baltimore, MD, Jan. 15-18, 2003.
65. "Knot invariants defined by coloring diagrams and quandle cohomology theory," presented at Topology Seminar, University of Texas at Austin, Dec. 3rd, 2001.

66. "Extensions and cocycle invariants from twisted cohomology theory of quandles," presented at 972nd American Mathematical Society (AMS) meeting, University of California, Irvine, Nov. 11th, 2001.
67. "Extensions of quandles and cocycle knot invariants," presented at 969th AMS meeting, Ohio State University, Columbus, Ohio, Sep. 23rd, 2001.
68. "Quandle cocycle invariants and shadow colored arc diagrams," presented at 4th International conference on knots, links and manifolds, Siegen, Germany, Jan. 4-8, 2001. (Presented on Jan. 7th.)
69. "Quandle cocycle invariants and shadow colored arc diagrams," presented at 958th AMS meeting at San Francisco State University, Oct. 21-22, 2000 (presented on Oct. 22).
70. "Quandle cohomology and state-sum invariants of knotted curves and surfaces," presented at Knots 2000, Korea, July 31 – August 5, 2000 (presented on Aug. 1st).
71. "Quandle cohomology and state-sum invariants of knotted curves and surfaces," presented at KNOTS in WASHINGTON 10, Japan - USA ; workshop in Knot Theory, January 23-30, 2000
72. "State-sum invariants for knotted curves and surfaces from quandle cohomology," at Symposium on racks, University of Tokyo, Oct. 21-23, 1999.
73. "State-sum invariants for knotted curves and surfaces from quandle cohomology," at Workshop in Knot Theory, Toronto, July 13-16, 1999.
74. "State sums for triangulated 4-manifolds and their diagrammatics," at the American Mathematical Society meeting # 932 (special session) at Manhattan, Kansas, March 27-28, 1998.
75. "Structures and diagrammatics of four dimensional lattice field theories", at the American Mathematical Society meeting (special session) at Baltimore, Maryland, January 7-10, 1998.
76. "Templates and Hopf algebras," at the American Mathematical Society meeting (special session) at Georgia Tech, Atlanta, Georgia, Oct. 17-18, 1997.
77. "A combinatorial description of knotted surfaces and their isotopies", at the American Mathematical Society meeting (special session) at University of Maryland, College Park, Maryland, April 12-13, 1997.
78. "Knotted surfaces and 2-categories", at Workshop on Higher Category Theory and Physics, at Northwestern University, Evanston, Illinois, March 28-30, 1997.
79. Workshop on "Combinatorial Problems Arising in Knots and 3-Manifolds," at the Mathematical Sciences Research Institute, Berkeley, January 21-24, 1997.
80. Special session on knot theory (special session organized by Tim D. Cochran), A.M.S. meeting at Orlando, Florida (Jan. 96). (The talk was delivered by L.H. Kauffman because of family emergency.)
81. Special session on 6j-symbols (organized by Jack Tawber), A.M.S. 900th meeting at Chicago, Illinois (Mar. 1995).
82. Special session on quantum topology (organized by L. Crane and D. Yetter), A.M.S. 891st meeting at Manhattan, Kansas (Mar. 1994).
83. Conference on knot theory, low dimensional manifolds, and quantum groups, (organized by J.S. Carter, D. Flath, R. Hitt, and D. Silver), Mobile, Alabama (Feb. 1994).
84. Special session on geometry and topology (organized by R. Forman and J. Luecke), A.M.S. 878th meeting at San Antonio, Texas (Jan. 1993).
85. Special session on knots and topological quantum field theory (organized by L. H. Kauffman), A.M.S. 876th meeting at Dayton, Ohio (Oct. 1992).
86. Georgia Topology Conference, University of Georgia, Athens, Georgia (Aug. 1992).
87. Conference on relations between topology and representation theory (organized by M. M. Kapranov), Northwestern University (May 1992).
88. Special session on new invariants of links and 3-manifolds (organized by Xiao-Song Lin), A.M.S. 874th meeting at Bethlehem, Pennsylvania (Apr. 1992).
89. Special session on low dimensional topology (organized by J. Luecke and R. Myers), A.M.S. 861st meeting at Denton, Texas (Nov. 1990).
90. Knots '90 (international conference on knot theory and related topics, organized by A. Kawauchi, C. Gordon, J. Levine, W. Lickorish, K. Murasugi and L. Siebenmann) Osaka, Japan (Aug. 1990).
91. Georgia Topology Conference, University of Georgia, Athens, Georgia (Aug. 1990).

CONFERENCES CO-ORGANIZED

1. "Workshop on discrete and topological models in molecular biology," supported by NSF, USF Tampa, March 12-14, 2012, http://math.usf.edu/mathbio2012/.
2. Amer. Math. Soc. meeting #1079, special session on "Algebraic and combinatorial structures in knot theory," March 10-11, 2012, at USF Tampa.
3. "Knotting mathematics and art: International conference on low-dimensional topology and mathematical art," supported by NSF, USF Tampa, Nov. 1-4, 2007, http://knotart.cas.usf.edu/.
4. Amer. Math. Soc. meeting #982, special session on "Invariants of knots and low dimensional manifolds," Nov. 9-10, 2002, at Univ. of Central Florida.

ACADEMIC SERVICES

Academic Editor, Journal of Knot Theory and its Ramifications, World Scientific.

GRANTS

1. National Institute of Health, "RNA-guided Genome Rearrangement: Experiments Coupled with Discrete Models," (PI: N. Jonoska, Co-PI: M. Saito, with collaborator PI: L. Landweber at Princeton), NIH R01GM109459, project period: 09/01/13 - 06/30/18.
2. National Science Foundation, "Workshop on Discrete and Topological Models in Molecular Biology," conference grant (PI: N. Jonoska, Co-PI: M. Saito), DMS-1157242, 03/08/2012 – 03/07/2013.
3. National Science Foundation, "Collaborative Research: RNA-guided DNA recombination through assembly graphs," (PI: N. Jonoska, Co-PI: M. Saito, with collaborator PI: L. Landweber at Princeton), DMS-0900671, 09/01/2009 – 08/31/2013.
4. National Science Foundation, "Knotting Mathematics and Art: Conference in Low Dimensional Topology and Mathematical Art," conference grant (PI: N. Jonoska, Co-PI: M. Saito), DMS-0726492, 09/01/2007– 08/31/2008.
5. National Science Foundation, "Collaborative research: Algebraic structures and cohomology theories associated to knottings," (with J.S. Carter at University of South Alabama), DMS-0603876, 08/15/2006 – 07/31/2010.
6. National Science Foundation, "Collaborative research: Cocycle invariants of low-dimensional knots and manifolds," (with J.S. Carter at University of South Alabama), DMS-0301089, June 2003 – May 2006.
7. National Science Foundation, "Cohomology state-sum invariants in dimensions 3 and 4," (with J.S. Carter at University of South Alabama), DMS-9988101, June 2000 - May 2003.