

**CURRICULUM VITAE**  
**YUANAN DIAO**

**EDUCATION**

- Ph.D.** Mathematics 1986–1990 Florida State University, Tallahassee, Florida.  
**M.S.** Applied Math. 1982–1984 Beijing University of Science and Tech., China.  
**B.S.** Mathematics 1978–1981 Wuhan University of Technology, China.

**PROFESSIONAL EXPERIENCE**

**University of North Carolina Charlotte**

**Visiting Associate Professor**, August 1996–July 1997.

**Associate Professor**, August 1997–June 2003.

**Professor**, July 2003 –.

**Department Chair**, July 2012 – July 2020.

**Kennesaw State University**

**Assistant Professor**, 1990–1995.

**Associate Professor**, 1995–1996.

**EXTERNAL GRANTS**

- PI, NSF Grant DMS-1016460 (2010–2013).
- PI, NSF Grant DMS-0920880 (2009–2013).
- PI, NSF Grant DMS-0712958 (2007–2010).
- PI, NSF Grant DMS-0310562 (2003–2006).

**DOCTORAL STUDENTS**

- John Nardo, 1998.
- Xunxiang Guo, 2005.
- Kenneth Hinson, 2010.
- Pengyu Liu, 2018.
- Van Pham, 2022.
- Dawn Ray, 2022.

## PUBLICATIONS

1. The Ropelengths of Alternating Montesinos Links Are Proportional to Their Crossing Numbers, Yuanan Diao and Claus Ernst, *J. Phys. A: Math. Theor.*, published online (open access) on 8/6, 2025 (18 pages). <https://doi.org/10.1088/1751-8121/adf8a5>.
2. The Enumeration of Alternating Pretzel Links, Charlotte Aspinwall, Tobias Clark and Yuanan Diao, *Journal of Knot Theory and its Ramifications*, **34**(8), 2550037 (28 pages). <https://doi.org/10.1142/S0218216525500373>, 2025.
3. The Braid Indices of Pretzel Links: A Comprehensive Study, Part I, Yuanan Diao, Claus Ernst and Gabor Heteyi, *Journal of Knot Theory and its Ramifications*, **34**(2), 2550003. <https://doi.org/10.1142/S0218216525500038>, 2025.
4. The Braid Indices of Pretzel Links: A Comprehensive Study, Part II, Yuanan Diao, Claus Ernst and Gabor Heteyi, *Journal of Knot Theory and its Ramifications*, **34**(1), 2450055. <https://doi.org/10.1142/S021821652450055X>, 2025.
5. The Ropelength conjecture of Alternating Knots, Yuanan Diao, *Math. Proc. Cambridge Phil. Soc.*, **177**(2), 367–369, 2024.
6. The Braid Indices of the Reverse Parallel Links of Alternating Knots, Yuanan Diao and Hugh Morton, *Algebraic and Geometric Topology*, **24**(5), 2957–2970, 2024.
7. The average genus of oriented rational links with a given crossing number, Dawn Ray and Yuanan Diao, *Journal of Knot Theory and its Ramifications*, **32**(02) 2350010 (12 pp), 2023.
8. Constructions of DNA and polypeptide cages based on plane graphs and odd crossing  $\pi$ -junctions, Xiaosheng Cheng, Qingying Deng and Yuanan Diao, *Applied Mathematics and Computation*, **443** 127773 (15 pp), 2023.
9. The Knot Spectrum of Random Knot Spaces, Yuanan Diao, Claus Ernst, Uta Ziegler, and Eric Rawdon. Book chapter in *New Directions in Geometric and Applied Knot Theory*, edited by Philipp Reiter, Simon Blatt and Armin Schikorra, Warsaw, Poland: De Gruyter Open Poland, 2022, pp. 205-237. <https://doi.org/10.1515/9783110571493-010>
10. Knots with equal bridge index and braid index, Yuanan Diao, Claus Ernst and Philipp Reiter. *Journal of Knot Theory and its Ramifications*, **30**(11) 2150075 (25 pp), 2021.
11. The number of oriented rational links with a given deficiency number, Yuanan Diao, Michael Lee Finney, Dawn Ray. *Journal of Knot Theory and its Ramifications*, **30**(9) 2150065 (20 pp), 2021.
12. A diagrammatic approach to the braid index of alternating links, Y. Diao, C. Ernst, G. Heteyi and P. Liu. *Journal of Knot Theory and its Ramifications*, **30**(5), 2150035 (36 pp), 2021.
13. Gabor single-frame and multi-frame multipliers in any given dimension, Yuanan Diao, Deguang Han and Zhongyan Li. *Journal of Functional Analysis*, **280**(9) 108960 (22 pp), 2021.
14. Writhe-like invariants of alternating links, Y. Diao and V. Pham. *Journal of Knot Theory and its Ramifications*, **30**(1) 2150004 (17 pp), 2021.

15. Configurations of DNA cages based on plane graphs and vertex junctions, X. Cheng and Y. Diao. *J. Phys. A: Math. Theor.*, **53** 395601 (21 pp), 2020.
16. Invariants of rational links represented by reduced alternating diagrams, Y. Diao, C. Ernst and G. Heteyi. *SIAM J. Discrete Math*, **34**(3), 1944–1968, 2020.
17. Braid index bounds ropelength from below, Y. Diao. *Journal of Knot Theory and its Ramifications*, **29** (4) 2050019 (10 pp), 2020.
18. Characterizing the topology of kinetoplast DNA using random knotting, P. Liu, R. Polischuk, Y. Diao and J. Arsuaga. *Contemporary Mathematics*, **746**, 17–40, 2020.
19. The braid index of DNA double crossover polyhedral links, X. Cheng and Y. Diao. *PLOS One*, **15**(2), e0228855, 2020. DOI: <https://doi.org/10.1371/journal.pone.0228855>.
20. The braid index of reduced alternating links, Y. Diao, G. Heteyi and P. Liu. *Math. Proc. Cambridge Phil. Soc.*, **168** (3), 415–434, 2020.
21. The ropelengths of knots are almost linear in terms of their crossing numbers, Y. Diao, C. Ernst, A. Por and U. Ziegler. *Journal of Knot Theory and its Ramifications*, **28** (14), 1950085 (64 pp), 2019.
22. The HOMFLY polynomial of links in closed braid form, P. Liu, Y. Diao and G. Heteyi. *Discrete Mathematics* **342**(1), 190–200, 2019.
23. Estimating properties of kinetoplast DNA by fragmentation reactions, L. Ibrahim, P. Liu, Y. Diao, M. Klingbeil and J. Arsuaga. *J. Phys. A: Math. Theor.* **52**(3) 034001, 2019.
24. Average crossing number and writhe of knotted random polygons in confinement, Y. Diao, C. Ernst, E. Rawdon and U. Ziegler. *Reactive and Functional Polymers* **131** 430–444, 2018.
25. Total curvature and total torsion of knotted random polygons in confinement, Y. Diao, C. Ernst, E. Rawdon and U. Ziegler. *J. Phys. A: Math. Theor.* **51** (15) 154002, 2018.
26. Relative frequencies of alternating and non-alternating prime knots and composite knots in random knot spaces, Y. Diao, C. Ernst, E. Rawdon and U. Ziegler. *Experimental Mathematics*. **27**(4) 454–471, 2018.
27. The knot spectrum of random knot spaces, Y. Diao, C. Ernst, U. Ziegler and E. Rawdon. *New directions in geometric and applied knot theory*, edited by Simon Blatt, Philipp Reiter, and Armin Schikorra. 205–237. De Gruyter, Berlin, 2017.
28. The effect of volume exclusion on the formation of DNA minicircle networks: implications to kinetoplast DNA, Y. Diao, K. Hinson, Y. Sun and J. Arsuaga. *J. Phys. A: Math. Theor.* **48** (2015): 435202.
29. Orientation of DNA minicircles balances density and topological complexity in kinetoplast DNA, Y. Diao, V. Rodriguez, M. Klingbeil and J. Arsuaga. *PLOS ONE* **10**(6): e0130998. doi: 10.1371 (June 2015).
30. Generating random walks and polygons with stiffness in confinement, Y. Diao, C. Ernst, S. Saariinen and U. Ziegler. *J. Phys. A: Math. Theor.* **48**(9) (2015): 095202.

31. Random walks and polygons in tight confinement, Y. Diao, C. Ernst and U. Ziegler. *Journal of Physics Conference Series*, **544**, (2014): 012017.
32. Properties of topological networks of flexible polygonal chains, J. Arsuaga, Y. Diao, M. Klingbeil, V. Rodriguez. *Molecular Based Mathematical Biology* **2**(1) 98–106 (2014).
33. The knot spectrum of confined random equilateral polygons, Y. Diao, C. Ernst, A. Montemayor, E. Rawdon and U. Ziegler. *Molecular Based Mathematical Biology* **2**(1) 19–33 (2014).
34. Relative Tutte polynomials of tensor products of colored graphs, Y. Diao and G. Heteyi. *Combinatorics Probability and Computing*, **22**(6), 801–828 (2013).
35. Percolation phenomena in disordered topological networks, V. Rodriguez, Y. Diao and J. Arsuaga. *Journal of Physics Conference Series* **454**, (2013): 012070.
36. Curvature of random walks and random polygons in confinement, Y. Diao, C. Ernst, A. Montemayor and U. Ziegler. *J. Phys. A: Math. Theor*, **46**(28), (2013): 285201.
37. Generating equilateral random polygons in confinement III, Y. Diao, C. Ernst, A. Montemayor and U. Ziegler. *J. Phys. A: Math. Theor*, **45**(46), (2012): 465003.
38. Generating equilateral random polygons in confinement II, Y. Diao, C. Ernst, A. Montemayor and U. Ziegler. *J. Phys. A: Math. Theor*, **45**(27), (2012): 275203.
39. Nullification of Knots and Links, Y. Diao, C. Ernst and A. Montemayor. *J Knot Theory Ramification*, **21**(6) doi: 10.1142/S0218216511009984 (2012).
40. Bounds for the minimum step number of knots confined to slabs in the simple cubic lattice, R. Scharein, K. Ishihara, J. Arsuaga, K. Shimokawa, Y. Diao and M. Vazquez. *J. Phys. A: Math. Theor*, **45**(6), (2012): 065003.
41. The growth of minicircle networks on regular lattices, Y. Diao, K. Hinson and J. Arsuaga,. *J. Phys. A: Math. Theor* **45**(3), (2012): 035004.
42. The effect of angle restriction on the topological characteristics of minicircle networks, J. Arsuaga, Y. Diao and K. Hinson. *Journal of Statistical Physics*, **146**(2), 434–445 (2012).
43. The effects of minicircle density on the topological structure of the mitochondrial DNA from trypanosomes, J. Arsuaga, Y. Diao, K. Hinson and R. Kaplan. *Journal of Mathematical Biology*, **64**(6), 1087–1108 (2012).
44. The linearity of the ropelengths of conway algebraic knots in terms of their crossing numbers, Y. Diao, C. Ernst and U. Ziegler. *Kobe Journal of Mathematics*, **28**, 1–19 (2011).
45. Generating equilateral random polygons in confinement, Y. Diao, C. Ernst, A. Montemayor and U. Ziegler. *J. Phys. A: Math. Theor*, **44**(40), (2011): 405202.
46. On  $s$ -elementary super frame wavelets and their path-connectedness, Y. Diao and Z. Li. *Acta Applicanda Mathematicae*, **116**(2), 157–171 (2011).
47. On the mean and variance of the writhe of random polygons, J. Portillo, J. Arsuaga, Y. Diao, R. Scharein and M. Vazquez. *J. Phys. A: Math. Theor*, **44**(27), (2011): 275004.

48. A Tutte-style proof of Brylawski's tensor product formula, Y. Diao, G. Heteyi and K. Hinson. *The European Journal of Combinatorics*, **32**(6), 775–781 (2011).
49. Modeling of chromosome intermingling by partially overlapping uniform random polygons, T. Blackstone, R. Scharein, B. Borgo, R. Varela and J. Arsuaga. *Journal of Mathematical Biology*, **62**(3) 371–389 (2011).
50. The path-connectivity of MRA wavelets in  $L^2(\mathbf{R}^d)$ , Zhongyan Li, Xingde Dai, Y. Diao and Wei Huang. *Illinois Journal of Mathematics*, **54**(2), 601–620 (2010).
51. On the direct path problem of  $s$ -elementary frame wavelets, X. Dai, Y. Diao and X. Guo. *Science of China Mathematics*, **53**(12), 3187–3196 (2010).
52. The mean squared writhe of alternating random knot diagrams, Y. Diao, C. Ernst, K. Hinson and U. Ziegler. *J. Phys. A: Math. Theor* **43**, doi: 10.1088/1751-8113/43/49/495202 (2010).  
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53. Intrinsic  $s$ -elementary parseval frame multiwavelets in  $L^2(\mathbf{R}^d)$ , Zhongyan Li, Xingde Dai and Y. Diao. *Journal of Mathematical Analysis and Applications*, **367**(2), 677–684 (2010).
54. Multipliers, phases and connectivity of wavelets in  $L^2(\mathbf{R}^2)$ , Y. Diao, Zhongyan Li, Xingde Dai, Y. Diao and Jianguo Xin. *Journal of Fourier Analysis and Applications* **16**(2), 155–176 (2010).
55. Relative Tutte polynomials for colored graphs and virtual knot theory, Y. Diao and G. Heteyi. *Combinatorics, Probability and Computing* **19**, 343–369 (2010).
56. Generating 4-regular Hamiltonian plane graphs, O. Ascigil, Y. Diao, C. Ernst, D. High and U. Ziegler. *Journal of Combinatorial Mathematics and Combinatorial Computing* **73**, 103–126 (2010).
57. Colored Tutte polynomials and composite knots, Y. Diao, G. Heteyi and K. Hinson. *DMTCS Proceedings* **01**, 479–490 (2009).
58. Bounds for the minimal step number of knots in the simple cubic lattice, R. Scharein, K. Ishihara, J. Arsuaga, K. Shimokawa, Y. Diao and M. Vazquez. *J. Phys. A: Math. Theor* **42**(47), (2009): 475006.
59. The growth of the average crossing number of equilateral polygons in confinement, J. Arsuaga, Y. Diao, B. Borgo and R. Scharein. *J. Phys. A: Math. Theor* **42**(46), (2009): 465202.
60. Invariants of composite networks arising as a tensor product, Y. Diao, G. Heteyi and K. Hinson. *Graphs and Combinatorics* **25**, 273–290 (2009).
61. Tutte polynomials of tensor products of signed graphs and their applications in knot theory, Y. Diao, G. Heteyi and K. Hinson. *Journal of Knot Theory and its Ramifications*, **18**(5), 561–590 (2009).
62. Jones polynomial of knots formed by repeated tangle replacement operations, Y. Diao, C. Ernst and U. Ziegler. *Topology and its Applications*, **156**, 2226–2239 (2009).
63. A partial ordering of knots through diagrammatic unknotting, Y. Diao, Claus Ernst and Andrzej Stasiak. *Journal of Knot Theory and its Ramifications*, **18**(4), 505–522 (2009).

64. Mathematical methods in DNA topology: applications to chromosome organization and site-specific recombination, J. Arsuaga, Y. Diao and M. Vazques. *Mathematics of DNA Structure, Function and Interactions*, Springer New York, 7–36 (2009).
65. On algebraic knots I: computability of their jones polynomials, Y. Diao, C. Ernst and U. Ziegler. *Knots and soft-matter physics: Topology of polymers and related topics in physics, mathematics and biology*, Organizers Tetsuo Deguchi et al, YITP-W-08-08, 20–23 (2009).
66. On algebraic knots II: an upper bound on their ropelength, Y. Diao, C. Ernst and U. Ziegler. *Knots and soft-matter physics: Topology of polymers and related topics in physics, mathematics and biology*, Organizers Tetsuo Deguchi et al, YITP-W-08-08, 24–27 (2009).
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68. A fast ergodic algorithm for generating ensembles of equilateral random polygons, R. Varela, K. Hinson, Y. Diao and J. Arsuaga. *Journal of Physics A: Mathematical and General*, **42** 095204 (2009).
69. DNA knotting in spooling like conformations in bacteriophages, J. Arsuaga and Y. Diao. *Computational and Mathematical Methods in Medicine*, **9**(3-4), 303–316 (2008).
70. Sampling large random knots in a confined space, J. Arsuaga, Y. Diao, K. Hinson, E. Karadayi and M. Saito. *Journal of Physics A: Mathematical and General* **40** 11697-11711 (2007).
71. Total curvature, ropelength and crossing number of thick knots, Y. Diao and Claus Ernst. *Math. Proc. Cambridge Phil. Soc.* **143**, 41–55 (2007).
72. How complex can a land suitability map be?, Y. Diao and W.-N. Xiang. *International Journal of Geographical Information Science*, **21**(7), 747–755 (2007).
73. Linking of uniform random polygons in confined spaces, J. Arsuaga, T. Blackstone, Y. Diao, E. Karadayi and M. Saito. *Journal of Physics A: Mathematical and General*, **40** 1925–1936 (2007).
74. An alternative and surprising solution to Olbers’ paradox, Y. Diao and Andrzej Stasiak. *International Journal of Contemporary Mathematical Sciences*, Vol. 2, no. 9–12, 445–449 (2007).
75. The path-connectedness of  $s$ -elementary tight frame wavelets, Xingde Dai and Y. Diao. *Journal of Applied Functional Analysis* **2**(4), 309–316 (2007).
76. Tutte polynomials of signed graphs and jones polynomials of some large knots, Y. Diao, G. Hetyei and K. Hinson. *Knot Theory for Scientific Objects*, (Proceedings of the International Workshop on Knot Theory for Scientific Objects held in Osaka, March 8–10, 2006), Editor Akio Kawachi. Osaka Municipal University Press. 1–16 (2007).
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78. Weyl-Heisenberg frame wavelets with basic supports, Xunxiang Guo, Xingde Dai and Y. Diao. *Contemporary Mathematics* **414**, 3–13 (2006).

79. Numerical upper bounds on ropelengths of large physical knots, Y. Diao, C. Ernst, R. Kavurluru and U. Ziegler. *Journal of Physics A: Mathematical and General*, Vol. 39, no. 18, 4829–4843 (2006). **An IOP Select paper.**
80. Quadrisecants give new lower bounds for the ropelength of a knot, Elizabeth Denne, Y. Diao and John Sullivan. *Geometry and Topology*, **10**, 1–26 (2006).
81. From Weyl-Heisenberg frames to infinite quadratic forms, Xunxiang Guo, Xingde Dai and Y. Diao. *International Journal of Pure and Applied Mathematics*, Vol. 26, no. 3, 343–357 (2006).
82. Hamiltonian cycles and ropelengths of conway algebraic knots, Y. Diao and C. Ernst, *Journal of Knot Theory and its Ramifications*, Vol.15, no.1, 121–142 (2006).
83. The path-connectivity of wavelets and frame wavelets, Xingde Dai and Y. Diao. RIMS Kokyuroku, No. 1455 (ISSN 1880-2818), 36–48 (2005).
84. On frame wavelet sets and some related topics, Xingde Dai and Y. Diao. RIMS Kokyuroku, No. 1455 (ISSN 1880-2818), 106–119 (2005).
85. The growth rate of some deficiency zero knot classes, Y. Diao and C. Ernst, *International Journal of Pure and Applied Mathematics*, Vol. 23, no. 4, 437–450 (2005).
86. Scaling of the average crossing number in equilateral random walks, knots and proteins, A. Dobay, Jacques Dubochet, A. Stasiak and Y. Diao. *Physical and Numerical Models in Knot Theory Including Applications to the Life Sciences* (eds Calvo J A, Millett, K C, Rawdon, E J and Stasiak, A). World Scientific Publishing, Singapore, 219–231 (2005).
87. The Average Crossing Number of Gaussian Random Walks and Polygons, Y. Diao and C. Ernst. *Physical and Numerical Models in Knot Theory Including Applications to the Life Sciences* (eds Calvo J A, Millett, K C, Rawdon, E J and Stasiak, A). World Scientific Publishing, Singapore, 275–292 (2005).
88. Generating Large Random Link Diagrams, Y. Diao, C. Ernst and U. Ziegler. *Physical and Numerical Models in Knot Theory Including Applications to the Life Sciences* (eds Calvo J A, Millett, K C, Rawdon, E J and Stasiak, A). World Scientific Publishing, Singapore, 473–494 (2005).
89. The average inter-crossing number of equilateral random walks and polygons, Y. Diao, A. Dobay and A. Stasiak, *Journal of Physics A: Mathematical and General*, Vol. 38, no. 35, 7601–7616 (2005).
90. Realizable Powers of Ropelengths by Nontrivial Knot Families, Y. Diao and C. Ernst, *JP Journal of Geometry and Topology*, Vol. 4, no. 2, 197–208 (2004).
91. The Additivity of Crossing Numbers, Y. Diao. *Journal of Knot Theory and its Ramifications*, Vol. 13, no. 7, 857–866 (2004).
92. On Super Wavelets, X. Dai, Y. Diao and Q. Gu, *Oper. Theory Adv. Appl.*, Vol 149, 153–165 (2004).
93. Frame Wavelets with Frame Set Support in the Frequency Domain, X. Dai, Y. Diao and Q. Gu, *Illinois Journal of Mathematics*, Vol. 48, no. 2, 539–558 (2004).

94. The s-elementary Frame Wavelets are Path Connected, X. Dai, Y. Diao, Q. Gu and D. Han, *Proceedings of AMS*, Vol. 132, no. 9, 2567–2575 (2004).
95. Hamiltonian Knot Projections and Lengths of Thick Knots, Y. Diao, C. Ernst and X. Yu, *Topology and its Applications*, Vol. 136, no. 1, 7–36 (2004).
96. The Average Crossing Number of Equilateral Random Polygons, Y. Diao, A. Dobay, R. Kusner, K. Millett and A. Stasiak, *Journal of Physics A: Mathematical and General*, Vol. 36, no. 46, 11561–11574 (2003). **An IOP Select paper.**
97. The Linear Growth in the Length of a Family of Thick Knots, Y. Diao, C. Ernst and M. Thistlethwaite, *Journal of Knot Theory and its Ramifications*, Vol. 12, no. 5, 709–715 (2003).
98. Frame Wavelet Sets in  $\mathbf{R}^d$ , X. Dai, Y. Diao, Q. Gu and D. Han, *Journal of Computational and Applied Mathematics*, **155**, 69–82 (2003).
99. The Existence of Subspace Wavelet Sets, X. Dai, Y. Diao, Q. Gu and D. Han, *Journal of Computational and Applied Mathematics*, **155**, 83–90 (2003).
100. Wavelets with Frame Multiresolution Analysis; X. Dai, Y. Diao, Q. Gu and D. Han, *Journal of Fourier Analysis and Applications*, Vol. 9, no. 1: 39–48 (2003).
101. The Lower Bounds of the Lengths of Thick Knots; Y. Diao. *Journal of Knot Theory and its Ramifications*, Vol. 12, no. 1: 1–16 (2003).
102. The Crossing Numbers of Thick Knots and Links; Y. Diao and C. Ernst, *Contemporary Math*, Vol. 304, 163–174 (2002).
103. Button Design for Map Overlays (II); Y. Diao and W. Xiang, *Environment and Planning: Planning and Design*, Vol.29, No.5: 673–685 (2002).
104. Frame Wavelets in Subspaces of  $L^2(\mathbf{R}^d)$ , X. Dai, Y. Diao, Q. Gu and D. Han, *Proceedings of AMS*, Vol.130, no. 11: 3259–3267 (2002).
105. Upper Bounds on Linking Number of Thick Links; Y. Diao, C. Ernst and Jance Van. Rensburg, *Journal of Knot Theory and its Ramifications*, Vol.11, No.2: 199–210 (2002).
106. Subspaces with Normalized Tight Frame Wavelets in  $L^2(\mathbf{R})$ ; X. Dai, Y. Diao and Q. Gu, *Proceedings of AMS*, Vol.130, no.6: 1661–1667 (2002).
107. Global Knotting in Equilateral Random Polygons; Y. Diao, J. Nardo and Y. Sun, *Journal of Knot Theory and its Ramifications*, Vol.10, No.4: 597–607 (2001).
108. Smooth Quantile Processes from Right Censored Data and Construction of Simultaneous Confidence Bands; Y. Diao, Y. Sun and S. Sun, *Communications in Statistics*, Vol.30, No.4: 707–728 (2001).
109. Frame Wavelet Sets in  $\mathbf{R}$ ; X. Dai, Y. Diao, and Q. Gu, *Proceedings of AMS*, Vol.129, No.7: 2045–2055 (2000).
110. The Minimum of Knot Energy Functions; X. Dai and Y. Diao, *Journal of Knot Theory and its Ramifications*, Vol.9, No.6: 713–724 (2000).

111. The Thicknesses of Knots; Y. Diao, C. Ernst and E. J. Janse van Rensburg, *Math. Proc. Cambridge Phil. Soc.*, **126**(2): 293–310 (1999).
112. Knots with Minimal Energies; Y. Diao, C. Ernst and E. J. Janse van Rensburg, *Ideal Knots*, Ser. Knots Everything, **19**, World Scientific Publishing Co., 52–69 (1998).
113. The Complexity of Lattice Knots; Y. Diao and C. Ernst, *Topology and its Applications*, Vol.90: 1–9 (1998).
114. Properties of Knot Energies; Y. Diao, C. Ernst and E. J. Janse van Rensburg, *Topology and Geometry in Polymer Science*, editors S. G. Whittington et al, the IMA Volumes in Mathematics and its Applications, vol103: 37–48 (1998).
115. The Percolation of Linked Circles; Y. Diao and Jance Van. Rensburg, *Topology and Geometry in Polymer Science*, editors S. G. Whittington et al, the IMA Volumes in Mathematics and its Applications, vol.103: 79–88 (1998).
116. In Search of a Good Polygonal Knot Energy; Y. Diao, C. Ernst and E. J. Janse van Rensburg, *Journal of Knot Theory and its Ramifications*, Vol.6, No.5: 633–657 (1997).
117. Knot Energy by Ropes; Y. Diao, C. Ernst and E. J. Janse van Rensburg, *Journal of Knot Theory and its Ramifications*, Vol.6, No.6: 799–807 (1997).
118. Packing Random Points in a Ball<sup>1</sup>, *The American Mathematical Monthly*, April 1996.
119. The Length of Overlapping Stacks<sup>1</sup>, *The American Mathematical Monthly*, October 1996.
120. The Knotting of Equilateral Polygons in  $\mathbf{R}^3$ , Y. Diao. *Journal of Knot Theory and its Ramifications*, Vol.4, No.2: 189–196 (1995).
121. Unsplittability of Random Links, Y. Diao. *Journal of Knot Theory and its Ramifications*, Vol.3, No.3: 379–389 (1994).
122. On Random Knots, Y. Diao, N. Pippenger and D.W. Sumners, *Journal of Knot Theory and its Ramifications*, Vol.3, No.3: 419–429 (1994).
123. The Number of Smallest Knots on the Cubic Lattice, Y. Diao. *Journal of Statistical Physics*, Vol.74, No.5: 1247–1254 (1994).
124. Minimal Knotted Polygons on the Cubic Lattice, Y. Diao. *Journal of Knot Theory and its Ramifications*, Vol.2, No.4: 413–425 (1993).
125. On the Limit Cycles of the Generalized Lienárd Equation System, Y. Diao. *J. of Beijing Institute of Technology*, No. 4: 1–15 (1986).
126. Qualitative Study of a Class of Cubic Systems, Y. Diao. *J. of Beijing Institute of Technology*, No. 3: 1–16 (1986).
127. The Nonexistence of Limit Cycles of the System  $\frac{dx}{dt} = y - F_4(x)$ ,  $\frac{dy}{dt} = -x$ , Y. Diao. *KEXUE TONGBAO*, VOL.30, No.1: 135–135 (1985).

## BOOKS

*Geometric Properties and Problems of Thick Knots*, Y. Diao and C. Ernst. Nova Science Pub Inc, December 2009.

## PROFESSIONAL MEMBERSHIPS

Member of American Mathematical Society since 1988.

## RECENT PROFESSIONAL PRESENTATIONS

12/24, *The Ropelengths of Alternating Knots*, Knots in Washington 50, George Washington University, Washington DC.

05/24, *The Braid Index and Ropelengths of Alternating Knots*, GEOTOP-A Seminar (Web-seminar series on Applications of Geometry and Topology).

04/24, *A numerical knotting complexity estimator for random knots*, BIRS Workshop: “Knot Theory Informed by Random Models and Experimental Data”, Banff, Canada.

01/24, *An algorithm for a better estimation of the braid index of a random knot*, Mathematics of Bacterial Viruses: From Virus Discovery to Mathematical Principles, SIAM Minisymposium, San Francisco, CA.

01/24, *The ropelength of alternating knots*, Mathematical Modeling of Nucleic Acid Structures, special session of the JMM 2024. San Francisco, CA.

10/23, *The ropelength of alternating knots*, Applied Knot Theory, special session of the 2023 Fall Central Sectional Meeting, Creighton University, Omaha, NE.

05/23, *The Braid Indices of the Reverse Parallel Links of Alternating Knots*, Tangled in Knot Theory, ICERM, Brown University, Providence, RI.

10/22, *The Ropelength Conjecture of Alternating Knots*, Applied Knot Theory, special session of the 2022 Fall Southeastern Sectional Meeting of AMS. University of Tennessee at Chattanooga, Chattanooga, TN.

05/22, *The ropelength of alternating knots*, Discrete and Topological Models in Molecular Biology (DTMB-2022). University of South Florida, Tampa, FL.

12/21, *The ropelength of alternating knots*, Knots in Washington 49.5, Hybrid Conference with the in person part at George Washington University.

04/21, *The Ropelengths of Knots*, colloquium talk (virtual), Department of Mathematics, UC Santa Barbara.

03/19, *Braid Index Bounds Ropelength From Below*, The Topology of Nucleic Acids: Research at the Interface of Low-Dimensional Topology, Polymer Physics and Molecular Biology, Banff International Research Station, Banff, Canada.

01/19, *The Ropelengths of Knots*, AMS–CMS Joint Annual Meeting, Baltimore, Maryland.

06/18, *Braid index of several classes of alternating links*, The 3rd International Workshop on Graphs and Knots, Xiamen University, Xiamen, China.

03/18, *Tutte Polynomials, Relative Tutte Polynomials And Virtual Knot Theory*, Invited Colloquium Talk, Department of Mathematics, Georgia State University.

11/17, *A Diagrammatic Approach to the Braid Index of Alternating Links*, The Geometry and Topology of Knotting and Entanglement in Proteins, Banff International Research Station for Mathematical Innovation and Discovery (BIRS) and Casa Matemática Oaxaca (CMO), Oaxaca City, Mexico.

07/17, *What to use and how to use it to detect the topology of a biological system*, Workshop on Topology of the biomolecular world, American Institute of Mathematics, San Jose, CA.

06/17, *Theory of knots and links*, Department of Mathematics, Northern Electrical Power University, Beijing, China.

10/16, *On Random Knots*, AMS Northeastern Sectional Meeting, University of St Thomas, Minneapolis, MN.

09/16, *How Topology and Confinement Affect the Geometry of Random Knots*, Workshop on Knots and Links in Biological and Soft Matter Systems, Trieste, Italy (International Centre for Theoretical Physics).

06/16, *Introduction to Knot Theory and its Applications*, Hubei University of Technology (China).

06/16, *The Ropelengths of Knots*, International Workshop on Graphs and Knots, Xiamen University (China).

04/16, *The Braid Index Problem of Alternating Links*, Mathematics Conference to Celebrate the 75th Birthday of De Witt Sumners, Tallahassee, FL.

11/15, *The Topological Structure of the Mitochondrial DNA from Trypanosomes*, Department of Mathematics, UC Davis.

11/14, *Tutte polynomials, relative Tutte polynomials and virtual knot theory*, AMS Eastern Sectional Meeting, University of North Carolina Greensboro, Greensboro, North Carolina.

08/14, *The Minicircle Network of the Mitochondrial DNA from Trypanosomes*, SIAM Conference on Life Sciences 2014, Charlotte, NC.

07/14, *Knot theory and DNA topology*, Department of Mathematics, Shanghai University, Shanghai, China.

06/14, *Tutte polynomials, relative Tutte polynomials and virtual knot theory*, Department of Mathematics, Guizhou University, Guiyang, China.

06/14, *Knot theory and DNA topology*, Department of Mathematics, Yangzhou University, Yangzhou, China.

04/14, *Tutte polynomials, relative Tutte polynomials and virtual knot theory*, Department of Mathematics, University of Central Florida, Orlando, Florida.

04/14, *The linking of uniform random polygons*, AMS Western Sectional Meeting, University of New Mexico, Albuquerque, New Mexico.

06/13, *From Tutte Polynomial to Jones Polynomial*, invited colloquium speaker, Southwestern University of Finance and Economics, Chengdu, China.

04/13, *On the Ropelength Problem of Knots*, invited speaker, Oberwolfach Workshop on Geometric Knot Theory, Oberwolfach, Germany.

07/12, *The Effects of Confinement on the Structure of the Mitochondrial DNA from Trypanosomes*, plenary speaker, the “UnKnot Conference”, Denison University, Ohio.

05–06/12, *Knot theory and its application in biology*, Central University of Finance and Economics (Beijing, China), Northern Electrical Power University (Beijing, China), East China University of science and Technology (Shanghai, China), East China Normal University (Shanghai, China), Wuhan University (Wuhan, China), and Hubei Second Normal University (Wuhan, China).

03/12, *Generating Equilateral Random Polygons in Confinement*, invited speaker at the conference “Discrete and Topological Models in Molecular Biology”, AMS Southeast Sectional Meeting, University of South Florida, Tampa, Florida.

03/12, *Relative Tutte Polynomial of Tensor Product of Colored Graphs*, AMS Western Sectional meeting, University of Hawaii, Honolulu, Hawaii.

## **UNIVERSITY AND COMMUNITY SERVICES**

### **Department:**

Department Chair, 07/2012 – 06/2020.

Advisory Committee, 2003 – 2007, 2011 – 2013, 2020 – 2022.

Department Review Committee, 2007 – 2010, 2021 – 2023.

Undergraduate Coordinator, 2000 – 2002.

Faculty Selection Committee, 2001 – 2004, 2005 – 2006, 2007 – 2008.

Strategic Planning Committee, 2006 – 2008.

Senior Project Advisor.

Colloquium Committee, 2007 – 2008.

Graduate Curriculum Committee, 1997 – 1998, 1999 – 2000.

Graduate Recruitment Committee, 2009 – 2010.

Student Advising Committee, 2008 – 2012.

Undergraduate Curriculum Committee, 2000 – 2002 (Chair).

Faculty Mentor Committee, UNC Charlotte, 2000 – 2002.

Undergraduate Curriculum Committee, 1998 – 1999, 2003 – 2004, 2005–2006.

High School Math Contest Committee, 1997 – 1999, 2000 – 2008.

Putnam Contest Committee, 1997 – 1998.

### **College/University:**

University Faculty Council, 2009 – 2010.

College Review Committee, 2007 – 2009, 2022 – 2024.

College Council, 1998 – 2000, 2007 – 2009.

Chair, College Council, 2009 – 2010.

### **University and Community:**

Physical Science Specialist Hiring Committee, UNC Charlotte, 1998–1999.

Presenter (for the Math Dept), UNC Charlotte Open House, 2000 – 2002.

Speaker, 2000 North Carolina Junior Science and Humanities Symposium.

Co-organizer, Great Plains Operator Theory Symposium (GPOTS), UNC Charlotte, 2002.

Organizer, AMS Meeting Special Sessions, 1999 (UNC Charlotte).

Organizer, AMS Meeting Special Sessions, 2003 (Florida State University).

Organizer, AMS Meeting Special Sessions, 2006 (Western Kentucky University).

Organizer, AMS Meeting Special Sessions, 2007 (Middle Tennessee University).

Organizer, AMS Meeting Special Sessions, 2011 (Wake Forest University).

Co-organizer, 2018 Summer Conference on Topology and its Applications, 2018 (Western Kentucky University).

Reviewer: National Science Foundation (USA), National Science Foundation of Switzerland, Science Foundation of Israel, Natural Sciences and Engineering Research Council of Canada, Mathematics Review (since 1995).

Referee: Journal of Knot Theory and its Ramifications, Proceeding of AMS, Topology and its Applications, Journal of Concrete and Applicable Mathematics, Applied Computational Harmonic Analysis, Contemporary Mathematics, Journal of Theoretical Biology, Acta Applicanda Mathematicae, Canadian Journal of Mathematics, Macromolecules, Journal of Physics A (Math and General), Electronic Journal of Combinatorics, Journal of Chemical Physics.