

ELENI PANAGIOTOU

CV - Eleni Panagiotou - 1

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RESEARCH INTERESTS: Knot theory, structure of macromolecules, molecular simulation

EDUCATION:

Ph.D. in Mathematics 2013 National Technical University of Athens (NTUA), Greece
Title of Ph.D. Thesis: Topological methods for measuring the entanglement in polymers
Advisor: Professor Sofia Lambropoulou

Members of the Advisory Committee: Professor K. C. Millett, UCSB, Professor D. N. Theodorou, NTUA

M.Sc. in Applied Mathematical Sciences 2008 National Technical University of Athens, Greece

Title of M.Sc. Dissertation: A study of the entanglement in polymers
Advisor: Professor Sofia Lambropoulou

Diploma in Applied Mathematics (5 year cycle of studies) 2007 School of Applied Mathematical and Physical Sciences National Technical University of Athens, Greece

Title of Diploma Dissertation: Twelve Proofs of the Fundamental Theorem of Algebra
Advisor: Professor Sofia Lambropoulou

ACADEMIC POSITIONS:

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|-------------------------|--|
| August 2022 - Present | Arizona State University (ASU), Assistant Professor (tenure-track), School of Mathematical and Statistical Sciences |
| August 2018 - Aug. 2022 | University of Tennessee at Chattanooga (UTC) , Assistant Professor (tenure-track), Department of Mathematics and SimCenter |
| July 2016 - July 2018 | University of California, Santa Barbara (UCSB), Lecturer, Department of Mathematics |
| July 2013 - July 2016 | University of California, Santa Barbara, Visiting Assistant Professor, Department of Mathematics |
| Jan - June 2013 | National Technical University of Athens, Greece, MIS grant of Professor S. Lambropoulou, grant no. 380154 |

VISITING POSITIONS:

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| June-July 2020 | Kavli Institute of Theoretical Physics, UCSB (scheduled for in person but became virtual) |
| Sep - Dec 2012 | Isaac Newton Institute for the Mathematical Sciences, Cambridge, UK |
| 2011-2012 | Visiting Researcher, Swiss Federal Institute of Technology ETH Zurich, Department of Materials, Supervisor: Professor M. Kröger |

RESEARCH FUNDING

12. July 2024-June 2025 “Mathematics in the fight against Alzheimer’s Disease”, ASU Women and Philanthropy Award, (PI) (\$49,096).
11. September 2023 - August 2026: “Topological dynamics models of protein function”, National Institutes of Health, National Institute of General Medical Sciences, R01GM152735 (PI) (\$589,351)
10. July 2023 - June 2024: “The topological landscape of proteins associated with neurodegenerative disease”, Arizona Alzheimer’s Disease Pilot Grant (PI) (\$30,000 direct costs).
9. August 2021 - July 2026: “NSF CAREER: Entanglement of active polymers”, National Science Foundation, Division of Materials Research and Division of Mathematical Sciences, 2047587 (PI) (\$537,785).
8. August 2019-July 2022: “RUI: Computational methods for measuring topological entanglement in polymers”, National Science Foundation, Division of Mathematical Sciences, Computational Mathematics, 1913180 (PI) (\$125,000).
7. May 2022-May2024: “CC* Compute: Augmenting a 2,560-core EPYC2 Computational Cluster with GPUs for AI, Machine Learning, and other GPU-Accelerated HPC Applications”, National Science Foundation (co-PI) (total \$408,235, nominee: \$0).
6. July2019 - July2020: “CC* Compute: A cost-effective 2,048 InfiniBand cluster at UTC for campus research and education”, National Science Foundation (co-PI) (total \$399,997, nominee: \$0).
5. August 2020-Dec. 2020 “A topological analysis of viral glycoproteins-application to the Spike protein of SARS-CoV-2” Center of Excellence in Applied Computational Science and Engineering UTC internal grant program (PI) (\$20,000).
4. July 2020-June 2021 “Topological design of porous metals for biomedical applications” Center of Excellence in Applied Computational Science and Engineering UTC internal grant program (PI) (\$100,000).
3. June 2019-May2022: “A study on the local and global effects of polymer entanglement in material properties and biological functions” Center of Excellence in Applied Computational Science and Engineering UTC internal grant program (PI) (\$100,000).
2. July 2022-June2023: “Exploring entanglements in polymer network topologies with single-chain nanoparticles” Center of Excellence in Applied Computational Science and Engineering UTC internal grant program (co-PI) (total \$100,000, nominee: \$23,445).
1. Fall 2021 “The local topological free energy of viral glycoproteins” Ruth S. Holmberg Grants for Faculty Excellence UTC internal grant (PI) (\$5,000).

PENDING RESEARCH FUNDING:

1. DMS Mathematical Biology (Emerging Mathematics in Biology): Collaborative Research: Identifying topologies for harnessing enzyme activity, (co-PI) (\$361,062)

PUBLICATIONS:

(* author undergraduate student, # author graduate student)

29. Masumi#, S. Kosik, K. and Panagiotou, E., **2024**, Mathematical prediction of tau filament mutation sites associated to tauopathies (submitted)
28. Barkataki#, K., Kauffman, L. H. and Panagiotou, E., **2024**, The virtual spectrum of linkoids and open curves in 3-space *J. Knot Theory Ramif.*, 33, 2450006 [\[link to full paper\]](#)
27. Masumi#, S. Kosik, K. and Panagiotou, E., **2024**, Mathematical topology and geometry-based classification of tauopathies, *Scientific Reports*, 14, 7560 [\[link to full paper\]](#)
26. Barkataki#, K. and Panagiotou, E., **2024**, The Jones polynomial in systems employing Periodic Boundary Conditions *J. Phys. A: Math. Theor.*, 57, 155202 [\[link to preprint\]](#)[\[link to full paper\]](#)
25. Millett, K. C. and Panagiotou, E. **2023**, The HOMFLY-PT polynomial of open links, *J. Knot Theory Ramif.* 10.1142/S0218216523400175 [\[link to full paper\]](#)
24. Panagiotou, E. **2023**, Following the entangled state of filaments, *Science* (perspective), 380, 340-341 [\[link to full paper\]](#)
23. Herschberg*, T., Pifer*, K. and Panagiotou, E. **2023**, A computer package for measuring topological entanglement in polymers, proteins and periodic structures (TEPPP), *Comp. Phys. Commun.* 286 108639 [\[link to full paper\]](#)
22. Barkataki#, K. and Panagiotou, E., **2022**, The Jones polynomial of collections of open curves in 3-space, *Proc. R. Soc. A* 478 20220302 [\[link to full paper\]](#)
21. Baldwin*, Q., Sumpter, B. G. and Panagiotou E., **2022**, The local topological free energy of the SARS-CoV-2 spike protein *Polymers* 14 (15) 3014 [\[link to full paper\]](#) (appeared in the news [\[Oak Ridge National Laboratory\]](#) [\[American Mathematical Society\]](#))
20. Wang*, J. and Panagiotou, E. **2022** The protein folding rate and the topology and geometry of the native state, *Scientific Reports* 12, 6384 [\[link to full paper\]](#)
19. Smith*, P. and Panagiotou, E., **2022** The second Vassiliev measure of random walks in confined space, *J. Phys. A: Math. Theor.* 55 095601 [\[link to full paper\]](#).
18. Panagiotou, E. and Kauffman, L. H., **2021**, Vassiliev measures of complexity for open and closed curves in 3-space *Proc. R. Soc. A* 477 20210440 [\[link to full paper\]](#)
17. Herschberg*, T., Carrillo, J-M., Sumpter, B. G., Panagiotou, E. and Kumar, R., Topological Effects Near Order-Disorder Transitions in Symmetric Diblock Copolymer Melts, **2021**, *Macromolecules*, 54, 74927499 [\[link to full paper\]](#)

16. Baldwin*, Q. and Panagiotou E., **2021**, The local topological free energy of proteins *J. Theor. Biology*, 529, 110854 [[link to full paper](#)]
15. Panagiotou E. and Kauffman L. H., **2020**, Knot polynomials of open and closed curves *Proc. R. Soc. A* 476 20200124 [[link to full paper](#)]
14. Panagiotou E. and Plaxco, K. W., **2020**, A topological study of protein folding kinetics, *Topology of Biopolymers, AMS Contemporary Mathematics Series* 746, 223 [[link to full paper](#)]
13. Panagiotou E., Delaney K. T. and Fredrickson G. H., **2019**, Theoretical prediction of an isotropic to nematic phase transition in bottlebrush homopolymer melts, *J. Chem. Phys.* 151, 094901 [[link to full paper](#)]
12. Panagiotou E., Millett K. C. and Atzberger P., **2019**, Topological Methods for Polymeric Materials: Characterizing the Relationship Between Polymer Entanglement and Viscoelasticity, *Polymers* , 11 (3), 437. [[link to full paper](#)]
11. Panagiotou E., **2019**, Topological entanglement and its relation to polymer material properties Knots, Low-Dimensional Topology and Applications, Knots in Hellas II, *Springer Proceedings in Mathematics and Statistics*, 435-447 [[link to full paper](#)]
10. Panagiotou E. and Millett K. C., **2018**, Linking matrices in systems with periodic boundary conditions *J. Phys. A: Math. Theor.* 51 225001 [[link to full paper](#)]
9. Millett K. C. and Panagiotou E., **2016**, Linking in systems with one-dimensional periodic boundaries, *Algebraic Modeling of Topological and Computational Structures and Applications, PROMS*, 237-257 [[link to full paper](#)]
8. Millett K. C. and Panagiotou E., **2016**, Entanglement transitions in one dimensional confined flows, *Fluid Dyn. Res.* 50 011416. [[link to full paper](#)]
7. Igram*, S., Millett, K. C. and Panagiotou E., **2016**, Resolving critical degrees of entanglement in olympic rings systems, *J. Knot Theory Ramif.* 25 14. [[link to full paper](#)]
6. Panagiotou E. **2015**, The linking number in systems with periodic boundary conditions, *J. Comp. Phys.* 300 533-573. [[link to full paper](#)]
5. Panagiotou E. and Kröger M., **2014**, Pulling force-induced elongation and alignment effects on entanglement and knotting characteristics of linear polymers in a melt *Phys. Rev. E* 90 042602. [[link to full paper](#)]
4. Panagiotou E., Kröger M and Millett K. C., **2013**, Writhe and mutual entanglement combine to give the entanglement length *Phys. Rev. E* 88 062604. [[link to full paper](#)]
3. Panagiotou E., Millett K. C. and Lambropoulou S., **2013**, Quantifying entanglement for collections of chains in models with periodic boundary conditions *Procedia IUTAM: Topological Fluid Dynamics II* 7 pp.251-260. [[link to full paper](#)]

2. Panagiotou E., Tzoumanekas C., Lambropoulou S., Millett K. C. and Theodorou D. N., **2011**, A study of the entanglement in systems with periodic boundary conditions *Prog. Theor. Phys. Supplement* 191 pp.172-181.[\[link to full paper\]](#)
1. Panagiotou E., Millett K. C. and Lambropoulou S, **2010**, The mean squared linking number and the writhe of uniform random walks in confined space *J. Phys. A:Math. Theor.* 43 045208-30.[\[link to full paper\]](#)

IN PREPARATION (final stages of preparation):

1. Barkataki[#], K. and Panagiotou, E., A parallel algorithm for the exact computation of the Jones polynomial.
2. Panagiotou, E., On the neighborhoods of knots in the space of simple curves in 3-space
3. Aspinall*, B., Barkataki[#], K. and Panagiotou, E., Topological prediction of the entanglement length in linear polymer melts
4. Murshed[#], M., Wang, J. and Panagiotou, E., Entanglement and crosslinking effects in active systems of linear polymers
5. Mandyah Nagaiah[#], H., Redemann, S. and Panagiotou, E., Geometry and topology of the meiotic spindle during cell division
6. Panagiotou, E., Vuong*, V. Q., Irle, S. and Sumpter, B. G., Geometry as a screening tool for strong binders to the SARS-CoV-2 Spike protein (under revision)
7. Millett, K. C. and Panagiotou, E., The HOMFLY-PT polynomial of the Conway and Kinoshita-Terasaka knots (under revision)

TEACHING EXPERIENCE:

Graduate courses at Arizona State University:

2023-2024 Introduction to Knot Theory and its Applications, Geometry and Topology of Manifolds I

Graduate courses at the University of Tennessee at Chattanooga:

2018-2020 Numerical Linear Algebra, Numerical Methods for Partial Differential Equations, Applied Knot Theory

Undergraduate courses at Arizona State University:

2022 - 2024 Linear Algebra, Applied Linear Algebra, Differential Geometry

Undergraduate courses at the University of Tennessee at Chattanooga:

2018-2020 Calculus with Analytic Geometry II, Elementary Linear Algebra, Complex Analysis, Numerical Analysis

Undergraduate courses at the University of California, Santa Barbara:

2013-2018 Introduction to Linear Algebra (350 students), Introduction to Group Theory, Classical Number systems, Partial Differential Equations, Introduction to complex variables I and II, Methods of Analysis, Transition to Higher Mathematics, Vector Calculus with Applications (350 students), Linear Algebra with Applications, Differential Equations, Calculus with Applications (350 students).

Short courses:

22-24 May 2019 Short Course on Applied Knot Theory and Molecular Simulation, University of Cadiz, Spain

GRADUATE RESEARCH SUPERVISION:

1. Masumi Sugiyama, PhD Mathematics, UTC (graduated July 2024, next: postdoctoral scholar at WPI SKCM2, University of Hiroshima, Japan)
2. Kasturi Barkataki, PhD Mathematics, ASU (since Spring 2021, expected graduation Spring 2025)
3. Windy Li, PhD Mathematics, ASU (since Summer 2024)
4. Paulina Malatesta, PhD Applied Mathematics, ASU (since Fall 2024)
5. Hyunsik Yun, PhD Applied Mathematics, ASU (Spring 2024)
6. Virginia Johnson, PhD Mathematics, ASU (Spring 2024)
7. Mandya Nagaiah, Hemanth Kumar, MS Mathematics, UTC (2020 - 2022), defended Masters thesis Spring 2022, now PhD student at the University of Iowa.
8. Maame Korsah, MS Mathematics, UTC (Summer 2021)
9. Evan Gildernew, PhD Chemical Engineering student, UTC (2019-2020, now in industry)
10. Jarod Wright, MS Mathematics UTC (2020-2021)

UNDERGRADUATE RESEARCH SUPERVISION:

1. Caleb Murshed, Data Science, ASU (2023-2024, senior thesis defended Spring 2024)
2. Ben Aspinall, Software Engineering, ASU, (since Summer 2023, REU AIM2 program ASU)

3. Avery Paulsen, Biology, ASU, (Fall 2023 - Spring 2024, now PhD student in Biomathematics at Florida State University))
4. Ron Balaney, Mathematics, ASU, (since Spring 2023)
5. Sophia Mastorakos, Biology, ASU, (since Fall 2023)
6. Eric Ren, Mathematics, ASU, (Spring - Fall 2023)
7. Coree Palmer, Mathematics, ASU, (Summer-Fall 2023, REU AIM2 program ASU)
8. Julia Fletcher, Mathematics, ASU (Fall 2023)
9. Stefan Stealey, Computer Science, ASU (Fall 2023)
10. Ethan Morgan, Mathematics, ASU (summer 2023, REU AIM2 program ASU)
11. Ava Nelson, Maricopa Community College (summer 2023 , REU AIM2 program ASU)
12. Achok Alier, Biology, UTC (Fall 2020-Spring 2023, now graduate student at Boston University)
13. Kyle Pifer, Computer Science, UTC (Spring 2022)
14. Jason Wang, Physics, U. Penn., REU icompbio UTC, Barry Goldwater Scholar 2023 (summer 2021), now at MD PhD program at Vanderbilt University School of Medicine
15. Jason Middlebrook, Computer Science, East Tennessee State Univ., REU icompbio UTC (summer 2021)
16. Dahlen Estran, Mathematics, UTC (Spring 2022)
17. Philip Smith, Mathematics, UTC (2021-2022, defended senior thesis in Spring 2022, now graduate student at Clemson University)
18. Arielle Beard, Biology, URTOPS UTC (2020-2021)
19. Quenisha Baldwin, Biology, Tuskegee University, REU icompbio program, UTC (2020-2022, obtained Masters Degree at the University of Alabama).
20. Tom Herschberg, Computer Science, UTC (2019-2021)
21. Spencer Igram, Co-supervision of senior thesis, STEM student, UCSB (2014)
22. Leticia Flores, Co-supervision of research program in CAMP (California Alliance for Minority Participation) and summer undergraduate research program at the Materials Research Laboratory UCSB (summer 2014, summer 2015)

HIGHSCHOOL STUDENT MENTORING:

1. Keira Shin, Gary K. Herberger Young Scholars Academy, (Fall 2023 - Spring 2024)

POSTDOCTORAL MENTORING:

1. Deepisha Solanki, Postdoctoral Associate, Mathematics, ASU (Fall 2024)
2. Puttipong Pongtapanaisan, Postdoctoral Associate, Mathematics, ASU (Fall 2023)

RESEARCH VISITS (funded):

02-05 May 2023 University of Pennsylvania (visiting Prof. R. Kamien)

22-25 January 2023 University of South Florida (visiting Prof. N. Jonoska)

22-26 April 2012 Université de Caen, France (visiting Prof. P. Bellingeri)

19-24 February 2012 Université de Caen, France (visiting Prof. P. Bellingeri)

INVITED LECTURES AND CONFERENCE PRESENTATIONS:

1. “Novel Topological Metrics of Protein Structure Complexity”, SIAM conference on Life Sciences, Special Session “Mathematics and Machine Learning in Biophysics”, June 11-12, 2024.
2. “Novel topological metrics of entanglement of polymeric material”, SIAM conference on Mathematics of Materials, Special Session “Topological Soft Matter”, May 21-22, 2024.
3. “Measures of entanglement of open curves in 3-space”, Topology Seminar, Department of Mathematics, Virginia Commonwealth University, April 19, 2024.
4. “The topological landscape of proteins associated with neurodegenerative disease”, Arizona Alzheimer’s Consortium retreat, Phoenix, March, 21, 2024.
5. “Topology and Geometry of Collections of Biopolymers”, workshop “The crossroads of topology, combinatorics and biosciences: deciphering the entanglement of multi-stranded nucleic acids”, 24w5267, Banff International Research Station, Banff, Canada, March, 18, 2024.
6. “Topological Entanglement of Polymers”, American Physical Society March meeting, Focus Session “Mechanics and self-assembly of knots and tangles: from knotted fabrics to polymer melts”, March 07, 2024.

7. “Novel topological metrics of entanglement in biopolymers”, AMS Special Session on Mathematical Modeling of Nucleic Acid Structures, Joint Mathematics Meetings, 05, January 2024.
8. “Entanglement in physical filaments”, Winter School, The International Institute for Sustainability with Knotted Chiral Meta Matter (SKCM2), University of Hiroshima, Japan, January 02, 2024.
9. “Introduction to the theory of simple curves in 3-space”, Winter School, The International Institute for Sustainability with Knotted Chiral Meta Matter (SKCM2), University of Hiroshima, Japan, January 02, 2024.
10. “Novel topological metrics of entanglement in filamentous matter”, WPI “Dynamics Statistics of Chiral Topological Matter” workshop, Massachusetts Institute of Technology, October 21, 2023.
11. “Novel metrics of topological complexity of open curves in 3-space”, AMS Fall Central Sectional Meeting Omaha, October 08, 2023.
12. “Novel metrics of topological entanglement in polymers”, Polymer Physics seminar, School of Chemical Engineering, National Technical University of Athens, Greece, July 07, 2023.
13. “The topology of physical filaments”, Geometry and Topology seminar, Department of Mathematics, University of Pennsylvania, May 04, 2023.
14. “Novel topological metrics of biopolymer structure and function”, Online Seminar Series on Mathematical Molecular Biosciences (MMB) co-organized by the University of Alabama and Michigan State University, May 04, 2023.
15. “Metrics of topological entanglement in biopolymers”, Special Session on Undergraduate Research in Mathematical Biology, Joint Mathematics Meetings, January 2023.
16. “Measures of knotting and entanglement of curves in 3-space”, Physical Mathematics Seminar, Massachusetts Institute of Technology, November 8, 2022.
17. “Topology of biopolymers”, Arizona Women’s Symposium in Mathematics, Embry-Riddle Aeronautical University, November 6, 2022.
18. “Quantifying the effect of RNA in tau protein aggregation using novel metrics of topological entanglement”, Fall Southwestern AMS meeting, University of Utah, October 22, 2022.
19. “Topology of polymers and biopolymers”, Professional Development Seminar, Arizona State University, October 17, 2022.
20. “Novel topological metrics of biopolymer structure and function”, Fall Southeastern AMS meeting, University of Tennessee at Chattanooga, October 16, 2022.
21. “Novel measures of topological complexity of protein structure and function”, Mathematical Biology Seminar, Arizona State University, September 30, 2022.
22. “Novel topological metrics of biopolymer structure and function”, Biological Physics Structural Discovery Seminar, Arizona State University, September 28, 2022.

23. "Topological entanglement in filamentous material and its effect on mechanical properties", The interdisciplinary World of Tangling, University of Potsdam, September 12-16, 2022.
24. "Measures of knotting and entanglement of curves in 3-space", AWM research symposium, June 2022.
25. "The Jones polynomial and the second Vassiliev measure of open curves in 3-space and their applications", JMM, Special Session on Skein Theory and Quantum Algebra, April 2022.
26. "Topological entanglement in polymer melts and solutions", Soft-Bio Seminar, UCSB, March 2022.
27. "Topological metrics of Biopolymer structure and function", Mathematics Colloquium and SimCenter Seminar, UTC, February 2022.
28. "Topological metrics of Biopolymer structure and function", Biological Engineering Seminar, UCSB, January 2022.
29. "Knot polynomials and Vassiliev measures of open curves in 3-space and their applications", Knot Theory seminar, Organizers: Roger Fenn and Louis Kauffman, October 2021.
30. "Knot polynomials and Vassiliev measures of open curves in 3-space and their applications", Knot Theory seminar, KAIST, August 2021.
31. "The local topology of SARS-CoV-2", BMSE/MCDB Joint Seminar, UCSB, April 2021
32. "The second Vassiliev measure of open curves in 3-space", UTC, April 2021
33. "Effects of topological entanglement in polymers" Workshop on Topology: Identifying Order in Complex Systems, UPenn, November 2020
34. "Knot polynomials of open and closed curves", Applied Knot Theory Workshop 2020, October 2020 (virtual)
35. "Using topology to study viscoelastic properties of polymers" Women in Mathematics of Materials organized by the AWM in SIAM Annual meeting, July 09 2020 (virtual)
36. "Measures of complexity for open and closed curves and application to polymers" Quantum Entanglement Seminar, Organized by L. H. Kauffman, July 09 2020 (virtual)
37. "Using topology to study viscoelastic properties of polymers" Conference on Physical Knotting, Vortices and Surgery in nature, Novosibirsk State University, July 08 2020 (virtual)
38. "Topological methods to study polymer entanglement" Topology Seminar, George Washington University, March 2020
39. "Knot polynomials of open and closed curves" Joint Mathematics Meetings, Denver, January 2020

40. “Knot polynomials of open and closed curves” AMS Sectional Meeting University of California Riverside, November 2019
41. “Theoretical prediction of an isotropic to nematic phase transition in bottlebrush homopolymer melts”, International Symposium Polymers and networks via topology and entanglement, Ochanomizu University, Tokyo, Japan, August 7-9, 2019
42. “Introduction to Applied Knot Theory”, UTC, Special Colloquium Series in REU Site: Research Training for Undergraduates in Mathematical Analysis with Applications in Allied Fields, July 22, 2019
43. “The effects of polymer entanglement and chain architecture on the mechanical properties of polymers”, Workshop “Biology, Analysis, Geometry, Energies, Links: A program on low dimensional Topology, Geometry and Applications”, Institute for Mathematics and its Applications, June 24-29, 2019
44. “A study of the effects of polymer entanglement and architecture to material properties”, Workshop “The Topology of Nucleic Acids: Research at the Interface of Low-Dimensional Topology, Polymer Physics and Molecular Biology”, Banff International Research Station, Canada, March 24-29 2019
45. “The effects of polymer entanglement and architecture to material properties”, Nanomaterials Theory Institute, Oak Ridge National Laboratories February 14, 2019
46. “The effects of entanglement on polymer viscoelasticity”, Applied Mathematics Seminar, University of Tennessee, Knoxville, February 13, 2019
47. “A study of entanglement in proteins”, JMM, Baltimore, January 2019
48. “A study of the effects of entanglement and chain architecture in polymers” University of Georgia (UGA) Department of Mathematics Seminar, November 16 2018
49. “The effect of topological and geometrical constraints on polymer material properties. “ AMS Fall Southern Sectional meeting Special Session on The Geometry of Curves and Applications, November 3-4 2018
50. ““A topological model for protein folding “ AMS Fall Western Sectional meeting Special Session on Mathematical Methods for the study of the Three Dimensional Structure of Biopolymers, October 27- 28, 2018
51. “A study of entanglement in physical systems and its relation to material properties and function”, Department of Mathematics and SimCenter Seminar UTC, September 28, 2018
52. “Polymer entanglement and viscoelastic properties of material”, SIAM conference on Life Sciences, Minneapolis August 7 2018

53. "A study of the effects of polymer entanglement on mechanical properties of material", The interplay of topology and material properties, Summer Conference on Topology and its Applications, University of Kentucky, Bowling Green, July 20, 2018
54. "Liquid crystals with applications to biology", MCAIM-WIMM Workshop, University of Michigan, Ann Arbor, May 14-18, 2018
55. "A topological model for protein folding kinetics", AMS Spring Eastern Sectional Meeting, Special Session of Topology of Biopolymers, Northeastern University, Boston, April 22, 2018
56. "Paths to Collaboration with Scientists", Panel Discussion on behalf of the Committee on the Profession of the AMS, JMM, San Diego, January 10-13, 2018
57. "Topological Approaches for Characterizing in Polymeric Materials the Local and Global Entanglement of Polymer Chains Relevant to Viscoelastic Mechanical Responses.", Invited talk to MS Special Session on Algebraic, Discrete, Topological and Stochastic Approaches to Modeling in Mathematical Biology, I, JMM, San Diego, January 10-13, 2018
58. "Topological Methods for Polymeric Materials: Characterizing the Relationship Between Polymer Entanglement and Viscoelasticity.", Invited talk to CMO--BIRS Workshop 17w5032 The Geometry and Topology of Knotting and Entanglement in Proteins, Oaxaca, Mexico, November 5-10, 2017
59. "Topological analysis and simulation of the roles of polymer entanglements in the viscoelastic responses of complex fluids", Invited talk to Stochastic and Multi-scale Models in Mathematical Biology, Analysis and Simulations, II, Fall Western Sectional Meeting, Riverside, California, November 04 2017
60. "Topological analysis and simulation of the roles of polymer entanglements in the viscoelastic responses of complex fluids", Invited talk to Conference on Means, Methods and Results in the Statistical Mechanics of Polymeric Systems II", Fields Institute, Toronto, Canada, June 12-14, 2017
61. "Topological analysis and simulation of the roles of polymer entanglements in the viscoelastic responses of complex fluids", Invited talk to 11th Southern California Flow Physics Symposium, University of California, San Diego, April 22, 2017
62. "Quantifying entanglement in physical systems", Invited talk to Claremont College Topology Seminar, February 14, 2017
63. "Linking polymer entanglements with the viscoelastic mechanics of polymeric materials using topological analysis and computational simulations", Invited talk to Complex Fluids Design Consortium Annual Meeting, organized by Prof. G. Fredrickson, Materials Research Laboratory, UCSB, February 3, 2017

64. "Linking polymer entanglements with the viscoelastic mechanics of polymeric materials using topological analysis and computational simulations", Invited talk to AMS Special Session on Knotting in Physical Systems, in celebration of Kenneth C. Millett's 75th birthday, Fall Central Sectional Meeting University of St. Thomas (Minneapolis campus), Minneapolis, MN October 28-30, 2016
65. "A study of the entanglement in systems of curves in Periodic Boundary Conditions", Invited talk to Prof. G. Fredrickson group, Department of Chemical Engineering, UCSB, June 2016
66. "A study of the entanglement in systems of curves in Periodic Boundary Conditions", Invited talk to Prof. F. Gibou group, Department of Mechanical Engineering, UCSB, June 2016
67. "Writhe and mutual entanglement combine to give the entanglement length", Talk to SIAM Conference on Mathematical Aspects of Material Science, May 2016
68. "A study of the entanglement in systems of curves in Periodic Boundary Conditions", Invited talk to AWM Workshop: Research Talks by Recent Ph.D.s: Mathematical Modeling and High-Performance Computing for Multiscale and Multiphysics Problems, 2015 SIAM Conference on Computational Science and Engineering, March 2015
69. "Pulling force-induced elongation and alignment effects on entanglement and knotting characteristics of linear polymers in a melt", Invited talk to AMS Western Section meeting, California State University, Fullerton, Fullerton, CA, October 2015
70. "A study of the entanglement in systems of curves in Periodic Boundary Conditions", Invited talk to Thales Workshop, NTUA, Greece, August 2015
71. "Writhe and mutual entanglement combine to give the entanglement length", Invited talk to AMS Western Section meeting, San Francisco State University, San Francisco, October 2014
72. "The linking number in systems of curves with Periodic Boundary Conditions", Hypatian Seminar, (Women association), UCSB, May, 05, 2014
73. "The linking number in systems of curves with Periodic Boundary Conditions", Invited talk to SIAM Undergraduate Research Mini-symposium, University of California, Santa Barbara, May 2014
74. "The linking number in systems of curves with Periodic Boundary Conditions", Invited talk to Claremont Topology Seminar, Pomona College, January 2014
75. "Entanglement in systems of curves with Periodic Boundary Conditions", Invited talk to International Workshop "Entanglement in biology; how Nature controls the topology of proteins and DNA", Banff International Research Station, November 2013.
76. "A study of the entanglement in polymer melts", Invited talk in Seminar of Continuum Mechanics and Topology and Geometry, University of Glasgow, November 2012

77. "A study of the entanglement in polymer melts", Invited talk in Seminar of Programme Topological Dynamics in the Physical and Biological Sciences, Isaac Newton Institute for Mathematical Sciences, November 2012
78. "Measures of entanglement in Polymer Melts.", Invited talk in Seminar of Chemical Engineers, University of Patras, School of Chemical Engineers, 20 July 2012
79. "The linking number in systems with Periodic Boundary Conditions.", Talk for Mini-course, Organizer Professor: A. Beliakova, Department of Mathematics, University of Zurich, April 2012
80. "A study of entanglement in Polymer Melts.", Invited talk in Seminar of Applied Mathematics and Mechanics (*seminar given in french*), Université de Caen, February 2012
81. "The Gauss linking integral and its application to the study of entanglement in polymers.", Seminar to students of the course: Introduction to Knot Theory, Swiss Federal Institute of Technology ETH Zurich, November 2011
82. "A study of the entanglement in polymer melts", Invited short talk to International Workshop "Polymer Dynamics: Entanglements and Architectures", Centro Congressi "Villa Orlandi", Capri, 26-29 July 2011 .
83. "A study of the linking number in systems with periodic boundary conditions" Invited short talk to International Conference "Knots and Links: From Form to Function", Centro di Ricerca Matematica Ennio de Giorgi, Pisa, 2-8 July 2011
84. "A study of the entanglement in systems with periodic boundary conditions", Invited short talk to International Workshop "Numerical Knots: Models and Simulations", Centro di Ricerca Matematica Ennio de Giorgi, Pisa, 8-9 June 2011
85. "The linking number of polymer chains in systems with periodic boundary conditions", Invited 40' talk to International Conference "Statistical Physics and Topology of Polymers with Ramifications to Structure of DNA and Proteins", Kyoto University, Japan, August 2010.
86. "The linking number and the writhe of uniform random walks and polygons in confined spaces", Invited short talk to International Conference "Conference on Knots and other entanglements in Biopolymers, Advanced School and Conference on Knot Theory", International Center of Theoretical Physics, Trieste, May 2009
87. "Topological methods for measuring the entanglement in polymers", Invited short talk to International Conference "Conference on Knots and other entanglements in Biopolymers, Topological and Geometrical Aspects of DNA, RNA and Protein Structures", International Center of Theoretical Physics, Trieste, September 2008

POSTER PRESENTATIONS:

1. “The topological landscape of neurodegenerative disease”, Arizona Alzheimer’s Consortium Annual Conference, September 11, 2023.
2. “The effects of entanglement on the mechanical properties of polymers”, Mathematical fluids, materials and biology, University of Michigan, 13-15 June, 2019
3. “Topological analysis and simulation of the roles of polymer entanglements in the viscoelastic responses of complex fluids”, SOCAMS (Southern California Applied Mathematics Symposium), UC Irvine, June 3 2017
4. “Viscoelastic mechanics of polymer entanglements linking molecular and bulk scales using topological analysis and computational simulations”, SOCAMS 2016, Claremont Colleges, June 04 2016
5. “The linking number in systems with periodic boundary conditions”, International Workshop “Tangled Magnetic Fields in Astro- and Plasma Physics”, ICMS, Edinburg, 15-19 October 2012
6. “Measuring entanglement in collection of open and closed macromolecules”, International Workshop “Topological Aspects of DNA Function and Protein Folding”, Isaac Newton Institute for Mathematical Sciences, Cambridge, 3-7 September 2012 (poster)
7. “A study of the entanglement in systems with periodic boundary conditions”, International Workshop “Knots and Links: From Form to Function”, Centro di Ricerca Matematica Ennio de Giorgi, Pisa, 2-8 July 2011 (invited short talk and poster)
8. “The linking number in systems with periodic boundary conditions”, International Conference “Swiss Knots, Knot Theory and Algebra”, sponsored by the Institute of Mathematics of the University of Zurich, Lake Thun, 23-27 May 2011
9. “Topological methods for measuring the entanglement in polymers”, Conference on Knots and other entanglements in Biopolymers, Topological and Geometrical Aspects of DNA, RNA and Protein Structures, International Center of Theoretical Physics, Trieste, September 2008.

SEMINARS AND POSTGRADUATE COURSES:

2013-2016 Topology seminar, Department of Mathematics, University of California, Santa Barbara

2011-2012 ETH Polymer Physics seminar, Organizer Professor H. C. Öttinger, Swiss Federal Institute of Technology ETH Zurich

2011 Molecular Simulation Course for Graduate Students, Professor D. N. Theodorou, National Technical University of Athens

2008-2011 Computational Materials Science and Engineering Group Seminar, Organizer Professor D. N. Theodorou, National Technical University of Athens

2005-2006 Algebra seminar for students, Organizer Professor S. Lambropoulou, National Technical University of Athens

SCHOOLS ATTENDED:

Winter Braids III, School on braids and low dimensional topology, Institut Fourier, 17-20 December 2012 (invited short talk)

Winter Braids II, School on algebraic and topological aspects of braid groups, University of Caen, 12-15 December 2011 (invited short talk)

Conference on Knots and other entanglements in Biopolymers, Advanced School and Conference on Knot Theory, International Center of Theoretical Physics, Trieste, May 2009 (invited short talk)

1-5 September 2006 Summer School on Mathematical Modelling, National Technical University of Athens

ORGANIZATION OF CONFERENCES and SEMINARS:

1. Mathematical Biology Seminar, Arizona State University (2023-2025).
2. Special Session on Topological Soft Matter at the SIAM Conference on Materials Science, Portland, May 19-23, 2024 (main organizer).
3. 5 day workshop Tangled in Knot Theory, The Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, May 22 - 25, 2023 (co-organizer).
4. Special Session on Applied Knot Theory at the AMS Fall Southeastern Sectional Meeting, University of Tennessee at Chattanooga, Chattanooga, TN, October 15-16, 2022 (main organizer).
5. Special Session on Mathematics of Materials, AWM Research Symposium, IMA and University of Minnesota, June 16-19, 2022 (main organizer)
6. 5 day workshop Novel Mathematical Methods in Material Science: Applications to Biomaterials (21w5232) BIRS, Banff, Canada (main organizer) (scheduled for in person but became virtual)

7. Workshop on Applied Knot Theory, University of Tennessee at Chattanooga, Chattanooga, TN, October 09, 2020 (main organizer) (scheduled for in person but became virtual).
8. Special Session on Applied Knot Theory at the AMS Fall Southeastern Sectional Meeting, University of Tennessee at Chattanooga, Chattanooga, TN, October 10-11, 2020 (main organizer) (scheduled for in person but became virtual).
9. Special Session on Advances in the Modeling and Computations of Fluid Flows and Fluid-Structure Interactions at the AMS Fall Southeastern Sectional Meeting, University of Tennessee at Chattanooga, Chattanooga, TN, October 10-11, 2020. (co-organizer) (scheduled for in person but became virtual).
10. Seminar of Advanced Modeling and Simulation, SimCenter, UTC (2020-2021).

HONORS/AWARDS

9. UC Foundation Professor, UTC, 2022 (Department heads or directors may identify junior faculty who would be most deserving of this honor and whom we might be likely to tie more closely to the institution through the means of supplementing salaries.)
8. “Exceeds expectations” UTC annual review 2019, 2020 and 2021.
7. New grants person award, UTC, 2020
6. Sep - Dec 2012 Financial Support of the Isaac Newton Institute for the Mathematical Sciences, Cambridge, UK for participation in the Programme “Topological Dynamics in the Physical and Biological Sciences”.
5. 2011-2012 Swiss Government Scholarship for research Swiss Federal Institute of Technology ETH Zurich
4. 2010-2011 Greek Ministry of Education, in collaboration with the European Commission PhD Scholarship “Irakleitos II”
3. 2008-2010 National Technical University of Athens Program Supporting Basic Research
2. “Thomaidio award 2010 for publications supporting research”, NTUA
1. Spring 2008 Ecole Polytechnique Fédérale de Lausanne, Switzerland Erasmus scholarship for MSc dissertation.

MEMBERSHIPS:

1. Affiliate Member of the International Institute for Sustainability with Knotted and Chiral Meta Matter, University of Hiroshima, Japan (since February 2024)
2. Member and Advisor of the AWM Student Chapter at UTC (2021-2022)

3. Member and Leader of the Advanced Modeling and Simulation Thrust of the SimCenter at UTC (July 2020-2022)
4. Member of the faculty senate, UTC (July 2020-2022)
5. Member of graduate faculty committee Department of Mathematics, UTC (2019-2021)
6. Member of the curriculum committee, Department of Mathematics, UTC (2019-2021)
7. Member of AMS, AWM, APS, SIAM.

REFEREEING AND REVIEWING:

Referee for: J. Knot Theory, Nature Communications, Science, Scientific Reports, J. Physics Letters A, J. Progress of Theoretical Physics, J. Physics A: Mathematical and General, Proceedings of the Royal Society A, Biophysical J., Proceedings of the National Academy of Sciences.

Reviewer for: Zentralblatt MATH

UNDERGRADUATE RESEARCH TRAINING: National Observatory of Athens, Topic: A method for computing the complementary error function, November 2004

COMPUTATIONAL SKILLS: C++, Python, Fortran, Perl, LAMMPS, VMD, Mathematica, Matlab, Latex, Microsoft Office, Linux

LANGUAGES:

Greek: fluent (first language)

English: fluent (TOEFL, First Certificate in English)

French: fluent (Diplôme approfondi de langue française)