

NATAŠA JONOSKA

Curriculum Vitae

Office Address

Department of Mathematics and Statistics
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EDUCATION:

- **PhD** 1993

Department of Mathematical Sciences, SUNY at Binghamton

- Fall 1988 - Spring 1993

Graduate course work at SUNY Binghamton

- Spring 1985 - Spring 1987

Graduate course work at University of Belgrade, Serbia (formerly Yugoslavia).

- Fall 1980 - Fall 1984 :

B.S. in Mathematics and Computer Science

University 'Cyril and Methodius' - Skopje Skopje, North Macedonia (formerly Yugoslavia).

POSITIONS HELD (over one month visiting positions):

- Fall 2018 – : *Distinguished University Professor*, University of South Florida, Tampa Florida.
- Fall 2006 – 2018 : *Professor*, University of South Florida, Tampa Florida.
- June 2015 – December 2015: *Blaise Pascal Professor*, Leiden University, the Netherlands.
- Summer 2009: *Visiting Research Professor* Université Pierre et Marie Curie, Paris, France.
- Jan - June 2008: *Visiting Researcher*, University of Milano - Bicocca, Milano, Italy.
- Fall 1998 - Spring 2006 : *Associate Professor*, University of South Florida, Tampa Florida.
- Summer 2003 : *Visiting Researcher*, University of Metz, Metz, France.
- Fall 2001 : *Visiting Scholar*, New York University, NY.
- Spring 2001 : *Van Vleck Visiting Associate Professor*, Wesleyan University, Middletown CT.
- Fall 1993 - Spring 1998 : *Assistant Professor*, University of South Florida, Tampa Florida.
- January 1993 - August 1993 : *Research Assistant*, SUNY-Binghamton, supported by the NSF grant CCR-9201345
- Summer 1989, Summer 1990 - Fall 1992 : *Teaching Assistant*, Dept. of Math. Sciences, SUNY-Binghamton
- Fall 1988 - Spring 1990 : *Graduate Assistant*, Dept. Math. Sciences, SUNY-Binghamton,
- April 1985 - June 1988 : *Full time employment as assistant/instructor*, Faculty of Natural and Mathematical Sciences, University 'Cyril and Methodius'-Skopje (North Macedonia),

GRANTS, AWARDS AND MEMBERSHIPS:

Special issue of Theoretical Computer Science in honor of N.Jonoska 60th birthday

MAA Award for Distinguished College or University Teaching of Mathematics 2021 – Florida Section

Fulbright Specialist 2019–2022

USF Outstanding Research Achievement Award 2015

2015 Blaise Pascal Professor, University of Leiden, the Netherlands

AAAS Fellow since 2014

2007 Rozenberg Tulip Award in DNA Computing and Molecular Programming awarded by ISNSCE (International Society for Nanoscale Science Computing and Engineering)

USF Presidential Excellence Award, USF 2003.

Best graduating student of the year 1984; Faculty of Natural and Mathematical Sciences at the University 'Cyril and Methodius' - Skopje.

Grant awards (since 2010, continuous NSF support since 2000)

- W.M. Keck Foundation - Deciphering the cryptic language of ribose incorporation in human DNA (Collaborative with F. Storici GA Tech) (total \$1M, no overhead) (**co-PI** award \$300,000) 08/01/21-07/31/24
- NSF CCF - Collaborative Research FTE-Medium: Three Dimensional Algorithmic Assembly and Information Storage; (Collaborative proposal with C. Mao at Purdue University and N. Seeman at NYU) (USF **PI** award \$374,998) (total \$1.2M), 07/01/21-06/30/24.
- DMS/NIGMS 2: Collaborative Research: Modeling R-loop formation and topology using braids and graphs coupled with single-molecule footprinting (Collaborative Research with F. Chedin and M. Vazquez UC Davis) (USF **PI** award \$399,998) (total: \$1.2M) 07/01/21-06/30/24.
- Developments in Language Theory, NSF, **PI** (co-PI D. Savchuk, USF) \$10,000, 8/2019 – 1/2021.
- Developments in Language Theory, USF Sponsored Research, **PI** (co-PI D. Savchuk, USF) \$5,000, 8/2019 – 1/2021.
- NSF DMS-NIGMS: Collaborative Research: Discrete and Topological Models for Template-Guided Genome Rearrangements **PI** (Co-PI M. Saito, Collaborative with L.F. Landweber at Columbia University) (total \$1,100,000) 7/15/18 – 7/14/22.
- NSF/Simons Foundation: Southeast Center for Mathematics and Biology, **co-PI** (Subcontracted through Georgia Tech, PI C. Heitsch) \$538,575 (total budget \$10M) 8/1/18 – 7/31/23.
- NIH- R01 GM109459 RNA-guided Genome Rearrangement: Experiments Coupled with Discrete Models, **PI** (co-PIs: M. Saito, USF and L.F. Landweber, Columbia University) Total budget \$2,000,000. 9/1/13–8/31/19.
- NSF CCF 1620729: DNA Computing and Molecular programming, **PI** \$25,500, 2/15/16 – 1/31/18.

- NSF CCF 1526485; AF: Small: Collaborative Research: Programmed Cyclic Molecular Dancing on 2D Origami Lattices **PI** , Collaborative with N. C. Seeman at NYU total award \$450,000 8/1/15–7/31/19.
- NSF-REU CCF-1117254-001 Research Experience for Undergraduates (**PI**) 5/13-8/15 \$10,000.
- London Math Society (LMS Scheme 2 grant) travel grant 3/12–8/12, \$2,300. (UK 2,000)
- NSF DMS-1157242: Workshop on Discrete and Topological Models in Molecular Biology (**PI**, M. Saito co-PI) \$29,072, 3/12 - 2/13.
- NSF CCF-1117254: Collaborative Research: Active DNA Assembly of Aperiodic Structures (**PI**) 08/11 - 07/15. (Collaborative research with N.C. Seeman, NYU, total award \$445,000)
- USF Sponsored Research : Workshop on Discrete and Topological Models in Molecular Biology, \$10,000, (**PI**, M. Saito co-PI) 06/11 - 12/12.
- NSF - Computability in Europe (**co-PI**, Douglas Cenzer, University of Florida, PI) - conference support \$20,000.
- NSF/NIH DMS-0900671: RNA guided DNA recombination through assembly graphs (**PI**, M. Saito co-PI) - 9/09 - 8/14. (Collaborative research with L. Landweber, Princeton University) total award \$1,400,000.
- NSF CCF-0726396: Programmable Molecular Movements(**PI**) 9/07-8/10. (Collaborative research with N. Seeman at NYU, total award \$300,000)

Memberships:

- International Society for Nanoscale Science Computing and Engineering, founding officer, (2004 –)
- American Association for Advancement in Science, January (1997 –)
- Society for Mathematical Biology, (2016 –)
- Society for Industrial and Applied Mathematics, (2015–)
- European Association of Theoretical Computer Science, (1994 –)
- Association for Women in Mathematics, (1992 –)

PROFESSIONAL ACTIVITIES AND SERVICE

Current Appointments

- Editorial Board: *Natural Computing* (associate editor) Springer - Verlag
- Editorial Board: *Theoretical Computer Science – C* Elsevier Science
- Editorial Board: *International Journal of Foundations of Computer Science* World Scientific
- Editorial Board: *Journal of Membrane Computing* Springer

- Editorial Board: *Computational and Mathematical Biophysics* formerly *Molecular Based Mathematical Biology* DE Gruyter
- Co-editor of volume: DNA Nanotechnology at 40 for the next 40 – Publication by Springer expected in Spring 2022.
- Advisory panel member for the Springer book series *Theory and Application of Computability*.
- Member of the Steering Committee (2006 –) for DNA Based Computers and Molecular Programming meetings. (Chair 2008–2017)
- Chair (organizing committee) *Developments in Language Theory*, University of South Florida, Tampa FL, May 09-13, 2022.
- Chair (organizing committee) *Topological and Discrete Models in Biomolecular Processes*, workshop at University of South Florida, Tampa FL, May 9-13, 2022.
- **Co-chair** of the Steering Committee for the Unconventional Computing and Natural Computing (2012 -)
- Member of the Steering Committee for Developments in Language Theory (2010 -)
- Member of the Steering Committee for Computability in Europe (2011 -)
- Member of the Steering Committee for Machines, Computations and Universality (2012 –)
- Co-editor Special Issue of NACO - Unconventional Computing and Natural Computing 2020.
- Co-editor Special Issue of IJFCS - DLT 2020.
- IPAM UCLA June 2019 – present, project co-leader with M. Vazquez and mentor *Collaborative Workshop for Women in Mathematical Biology*
- PC member of Automata 2021
- NSF panel review April 2019, December 2019, January 2020, April 2020, October 2021.

Recent Past Appointments

- Chair (organizing committee) *Developments in Language Theory*, University of South Florida, Tampa FL, May 11-15, 2020. (conference canceled due to pandemic)
- Chair (organizing committee) *Topological and Discrete Models in Biomolecular Processes*, workshop at University of South Florida, Tampa FL, May 9-13, 2020. (workshop canceled due to pandemic)
- Co-organizer with P. Bubenik: of AMS special Session *Applied topology: theory and applications* Gainesville, FL , November 2-3, 2019.
- Grant reviewer: NSF, NSERC, ANR (French Funding Agency).
- PC member for: CAI 2019 (July, Niš, Serbia), DNA25 (August 2019, Seattle WA), UCNC2019 (June, Tokyo).

- (organizer) SCMB Undergraduate Workshop *Molecular Origami* Georgia Institute of Technology, August 4–9, 2019.
- Finland Academy Panel for Academy Professorship, March 2018.
- Co-organizer with C. Heitsch: AMS Special Session *Mathematics of Biomolecules: Discrete, Algebraic, and Topological* Orlando, FL , September 23–24, 2017.
- NSF panel March 2017, March 2018.
- **Co-organizer** *Topological Methods in Brain Network Analysis*, Banff BIRS May 7–12, 2017.
- Member of the Scientific Committee for *Transversal Aspects of Tilings* thematic school at Oléron Frانس, June 2016.
- **Co-chair** of the PC for CiE 2016 from July 2015, to be held June 27 - July 1, 2016, Paris, France.
- **Co-chair** of the Steering Committee (2008 – 2017) for DNA Based Computers and Molecular Programming meetings.
- Editorial Board: *Computability* IOS - Press (2014 – 2020)
- PC member for DNA22 (September 2016, Munich, Germany)
- (past member) Editorial Board: *Soft Computing* published by Springer-Verlag.
- (past member) Editorial Board: *New Generation Computing* Springer-Verlag.
- Reviewer in 2016: panels for NIH, NSF; grants for NSERC (Canada).
- Editorial Board member for the *Handbook of Natural Computing* published 2012.
- Co-chair of the Program Committee for the Unconventional Computing and Natural Computing 2012 in Orleans, France.
- co-organizer (with A. Carbone, R. Twarok) AMS Special Session in Discrete Models in Molecular Biology, March 10-11, 2012, Tampa FL.
- co-organizer (with A. Carbone, K. Rejniak, R. Twarock, M. Saito) Workshop on Discrete and Topological Models in Molecular Biology, March 12–14, 2012, Tampa FL.
- co-edited (with J. Durand-Lose) special issue UCNC 2012 Natural Computing.

BOOKS:

- N. Jonoska, E. Winfree (eds) *DNA Nanotechnology at 40 for the next 40* – Springer 2022 (expected).
- N. Jonoska, D. Savchuk (eds) *Developments of Language Theory 24th International Conference, DLT 2020 Tampa, FL, USA, May 11-15, 2020*, Lecture Notes in Computer Science LNCS **12086** <https://doi.org/10.1007/978-3-030-48516-0>

- A. Beckmann, L. Bienvenu, N. Jonoska, (eds) *Pursuit of the Universal* 12th conference on Computability in Europe, CiE 2016, Paris France June 27 – July 1, 2016. LNCS **9709**, Springer 2016.
- N. Jonoska, M. Saito, (eds) *Discrete and Topological Models in Molecular Biology* Springer-Verlag 2014.
- J. Durand-Lose, N. Jonoska, (eds) *Unconventional Computation and Natural Computation* 11th International Conference, UCNC 2012 Orleans, France, September 3-7, 2012, LNCS **7445** Springer, 2012.
- J. Chen, N. Jonoska, G. Rozenberg, (eds) *Nanotechnology: Science and Computing*, Springer - Verlag 2006.
- N. Jonoska, Gh. Paun, G. Rozenberg, (eds.) *Aspects of Molecular Computing* LNCS **2950** Springer-Verlag 2004.
- N. Jonoska, N.C. Seeman, (eds.) *DNA Computing*, Revised papers from the 7th International Meeting on DNA Based Computers, LNCS **2340** Springer-Verlag 2002.
- N. Jonoska, *Molecular Information Processing: From Formal Models to Experimental Implementation* (in preparation) contract signed with Springer-Verlag.

RESEARCH PAPERS: (Mentored students and postdocs indicated with *)

1. J. Durand-Lose, H. J. Hoogeboom, N. Jonoska, *Deterministic Non-cooperative Binding in Two-Dimensional Tile Assembly Systems Must Have Ultimately Periodic Paths*, under review.
2. J. Ellis-Monaghan, N. Jonoska, *From Molecules to Mathematics* under review.
3. J. Braun*, R. Neme, Y. Feng and L. Landweber, N. Jonoska, *SDRAP for annotating scrambled or rearranged genomes*, under review.
4. J. Garrett*, N. Jonoska, H. Kim*, M. Saito, *DNA origami words, graphical structures and their rewriting systems* Natural Computing 20(2): 217-231 (2021)
5. N. Jonoska, N. Obatake, S. Poznanović, C. Price, M. Riehl, M. Vazquez *Modeling RNA:DNA Hybrids with Formal Grammars*, Using Mathematics to Understand Biological Complexity (R. Segal, B. Shtylla, S. Sindi, Eds.) Springer, Association for Women in Mathematics Series, (2021) 35–54.
6. N. Jonoska, *Recognizable and Regular Subsets of Monoids* Contributions, Section of Natural, Mathematical and Biotechnical Sciences, MASA, Vol. **41**, No. 2, (2020) 141 -146.
7. A. Mohammed*, N. Jonoska, M. Saito, *The Topology of Scaffold Routings on Non-Spherical Mesh Wireframes*, C. Geary, M.J. Patitz (eds) 26th International Conference on DNA Computing and Molecular Programming (DNA 26), Leibniz International Proceedings in Informatics (LIPIcs) vol **174** (2020) 1–17.
8. D. Genova, H.J. Hoogeboom, N. Jonoska, *Companions and an Essential Motion of a Reaction System* Fundamenta Informaticae, 175:1-4 (2020) 187–199.

9. M. Hajij, N. Jonoska, D. Kukushkin*, M. Saito, Graph Based Analysis for Gene Segment Interactions In a Scrambled Genome, *Journal of Theoretical Biology* **494** (2020) 110215. <https://doi.org/10.1016/j.jtbi.2020.110215>
10. N. Jonoska, H. Kim*, B. Mostowski*, M. Saito, *Symbol Separation in Double Occurrence Words*, *International Journal of Foundations of Computer Science*, 31:7 (2020) 915–928.
11. H. Hunter*, N. Jonoska, M. Saito, *Changes in Genus Ranges of 4-Regular Graphs by Insertions of Certain Subgraphs*, *Congressus Numerantium*, 232 (2019), pp.165-188
12. D. A. Cruz*, M. M. Ferrari*, N. Jonoska, L. Nabergall*, M. Saito, Insertions yielding equivalent double occurrence words, *Fundamenta Informaticae* 171, 113-132 (2020).
13. N. Jonoska, *Discovering Patterns in a Scrambled Genome*, *Mathematics Today*, October 12, (2019) 182–185.
14. J. Garrett*, N. Jonoska, H. Kim*, M. Saito, *DNA Origami Words and Rewriting Systems*, *Unconventional Computation and Natural Computation* (S. Seki et al. eds.). LNCS vol 11493 (2019) 94–107.
15. J. Garrett*, N. Jonoska, H. Kim*, M. Saito, *Algebraic Systems motivated by DNA Origami* Conference on Algebraic Informatics (M. Čirić et al. eds) LNCS vol 11545 (2019) 164–176.
16. X. Wang, A.R. Chandrasekaran, Z. Shen, Y. Ohayon, T. Wang, M. Kizer, R. Sha, C. Mao, H. Yan, X. Zhang, S. Liao, B. Ding, B. Chakraborty, N. Jonoska, D. Niu, H. Gu, J. Chao, X. Gao, Y. Li, T. Ciengshin, N.C. Seeman, *Paranemic Crossover DNA: There and Back Again*, *Chemical Reviews*, vol. 119, No. 10 (2019) 6273–6289.
17. R. Brijder, H.J. Hoogeboom, N. Jonoska, M. Saito, *Graphs associated with DNA rearrangements and their polynomials* in: *Algebraic and Combinatorial Computational Biology* (R. Robeva, M. Macauley, eds) Elsevier (2018) 61–85.
18. J. Ellis-Monaghan, N. Jonoska, G. Pangborn, *Tile-based DNA Nanostructures: Mathematical design and problem encoding* in: *Algebraic and Combinatorial Computational Biology* (R. Robeva, M. Macauley, eds) Elsevier (2018) 35–60.
19. J. Braun*, L. Nabergall*, R. Neme, L.F. Landweber, M. Saito, N. Jonoska *Russian Doll Genes and Complex Chromosome Rearrangements in *Oytricha trifallax* G3: Genes, Genomes, Genetics* May 1, 2018 vol. 8 no. 5 1669-1674. <https://doi.org/10.1534/g3.118.200176>
<http://www.g3journal.org/content/8/5/1669>
20. N. Jonoska, L. Nabergall*, M. Saito, *Patterns and Distances in Words Related to DNA Rearrangements* *Fundamenta Informaticae*, 154 (2017) 1–14.
21. J. Braun*, D. Cruz*, N. Jonoska, *Platform color designs for interactive molecular arrangements* *Unconventional Computing and Natural Computing* (M. Patitz, M. Stanett, eds.) (2017) LNCS 10240 (2017) 69-82.
22. D. Genova, H.J. Hoogeboom, N. Jonoska, *A graph isomorphism condition and equivalence of reaction systems* *Theoretical Computer Science* (2017), <https://doi.org/10.1016/j.tcs.2017.05.019>.

23. N. Jonoska, M. Krajčevski, G. McColm, *Traversal Languages Capturing Isomorphism Classes on Sierpiński Gaskets* Unconventional Computing and Natural Computing (M. Amos, A. Condon, eds.) LNCS 9726 (2016) 155–167.
24. J. Burns*, D. Kukushkin*, X. Chen, L.F. Landweber, M. Saito, N. Jonoska, *Recurring patterns among scrambled genes in the encrypted genome of the ciliate *Oxytricha trifallax**, Journal of Theoretical Biology (2016), pp. 171-180, <http://dx.doi.org/10.1016/j.jtbi.2016.08.038>.
25. J. Burns*, D. Kukushkin*, K. Lindblad, X. Chen, N. Jonoska, L.F. Landweber *(mds ies db): A database of ciliate genome rearrangements* Nucleic Acids Research 44:D1 (2016), D703-D709.
26. D. Buck, E. Dolzenko*, N. Jonoska, M. Saito, K. Valencia, *Genus Ranges of 4-Regular Rigid Vertex Graphs*, Electronic Journal of Combinatorics, 22(3) (2015), #P3.43.
27. N. Jonoska, M. Krajčevski, G. McColm, *Counter Machines and Crystallographic Structures* Natural Computing Volume 15, Issue 1 (2016) 97-113 DOI 10.1007/s11047-015-9527-0
28. N. Jonoska, N.C. Seeman, *Molecular Ping Pong Game of Life on a 2D Origami Array* Philosophical Transactions of the Royal Society - A. (Vol. 373, issue 2046) 15 June 2015.DOI: 10.1098/rsta.2014.0215
29. N. Jonoska, D. Karpenko*, S. Seki*, *Dynamic Simulation of 1D Cellular Automata in the Active aTAM*, New Generation Computing, 33 (2015) 271-295.
30. J. Burns*, N. Jonoska, M. Saito, *Genus Ranges of Chord Diagrams*, Journal of Knot Theory and Ramifications, Vol. 24 (2015) 1550022 (15 pages)
31. J. E. Padilla*, R. Sha, M. Kristiansen, J. Chen, N. Jonoska, N.C. Seeman *A Signal-Passing DNA Strand Exchange Mechanism for the Active Self-Assembly of DNA Nanostructures* Angewandte Chemie (2015) 11;54(20):5939-42. doi: 10.1002/anie.201500252
32. P. Bonizzoni, N. Jonoska. *Existence of Constants in Regular Splicing Languages*, Information and Computation, Volume 242 (2015) 340–353, DOI:10.1016/j.ic.2015.04.001.
33. N. Jonoska, M. Krajčevski, G. McColm, *Languages Associated with Crystallographic Symmetry* Unconventional Computing and Natural Computing (O. Ibarra et al. eds) LNCS 8553 (2014) 216–228 (best paper award), 10.1007/978-3-319-08123-6_18.
34. N. Jonoska, F. Manea, S. Seki, *A Stronger Square Conjecture on Binary Words* in SOFSEM 2014 (V. Geffert, B. Preneel, B. Rován, J. Stuller and A M. Tjoa eds) LNCS **8327** (2014) 339–351. 10.1007/978-3-319-04298-5_30
35. N. Jonoska, D. Karpenko*, *Active Tile Self-Assembly, Part 1: Universality at Temperature 1* International Journal of Foundation of Computer Science Vol. 25 Issue 2 (2014) 141–163. (DOI: 10.1142/S0129054114500087)
36. N. Jonoska, D. Karpenko*, *Active Tile Self-Assembly, Part 2: Recursion and Self-similarity* International Journal of Foundation of Computer Science Vol. 25 Issue 2 (2014) 165–194. (DOI: 10.1142/S0129054114500099)
37. T. Ratner*, R. Piran, N. Jonoska, E. Keinan, *Biologically Relevant Molecular Transducer with Increased Computing Power and Iterative Abilities* Chemistry & Biology, Cell Press Vol. 20, Issue 5 (2013) 726–733.doi:10.1016/j.chembiol.2013.02.016

38. J. Burns*, E. Dolzhenko*, N. Jonoska, T. Muche*, M. Saito, *Four-regular Graphs with Rigid Vertices Associated to DNA Recombination* Discrete and Applied Math online published Feb. 13, 2013 (DOI: 10.1016/j.dam.2013.01.003) Vol.161, Issues 10-11 (2013) 1378–1394.
39. A. Angeleska*, N. Jonoska, M. Saito, Rewriting rule chains modeling DNA rearrangement pathways, *Theoretical Computer Science* **454** (2012) 5–22 online: <http://dx.doi.org/10.1016/j.tcs.2012.04.041>
40. N. Jonoska, N.C. Seeman, Computing by molecular self-assembly, *Interface Focus* **2** (2012) 504511 online published doi:10.1098/rsfs.2011.0117
41. D. Genova*, N. Jonoska, Forbidding and enforcing conditions on Graphs, *Theoretical Computer Science* **429** (2012) 108 –117. DOI: 10.1016/j.tcs.2011.12.029
42. B. Chakraborty*, N. Jonoska, N. C. Seeman, A Programmable Transducer Self-Assembled from DNA, *Chemical Science, The Royal Society of Chemistry* **3** (2012) p. 168, DOI: 10.1039/c1sc00523e.
43. E. Dolzhenko*, N. Jonoska , Two-dimensional languages and cellular automata, *International Journal of Foundations of Computer Science*, **23-1** (2012) 185–206. DOI: 10.1142/S0129054112500037
44. P. Bonizzoni, N. Jonoska, Regular splicing languages must have a constant, *Developments in Language Theory* (G. Mauri and A. Leporati, Eds.) DLT 2011, LNCS **6795**(2011) 82–92.
45. N. Jonoska, M. Saito, DNA rearrangements through spatial graphs, *Computability in Europe* (F. Ferreira et al. eds.) LNCS **6158** (2010) 211–218.
46. N. Jonoska, J. Pirnot*, Finite state automata representing two-dimensional subshifts, *Theoretical Computer Science* **410:37** (2009) 3504–3512.
47. N. Jonoska, G. McColm, A. Staninska*, On Stoichiometry for the assembly of flexible-tile DNA complexes, *Natural Computing* **10** (2011) 1121–1141 (online: DOI: 10.1007/s11047-009-9169-1).
48. G. Wu*, N. Jonoska, N.C. Seeman, Construction of a DNA nano-object directly demonstrates computation, *BioSystems* **98** (2009) 80–84: doi:10.1016/j.biosystems.2009.07.004.
49. C. Liu, N. Jonoska, N. C. Seeman, Reciprocal DNA nanomechanical devices controlled by the same set strands, *Nano Letters* **Vol. 9** No. 7 (2009) 2641–2647.
50. E. Dolzhenko*, N. Jonoska, N.C. Seeman, Transducer generated arrays of robotic nano-arms *Natural Computing*.**9** (2010) 437–455 online: DOI 10.1007/s11047-009-9157-5
51. A. Angeleska*, N. Jonoska. M. Saito, DNA Rearrangement through assembly graphs *Discrete and Applied Math*, **157** (2009) 3020–3037.
(available online <http://dx.doi.org/10.1016/j.dam.2009.06.011>) .
52. R. Brijder, M. Daley, T. Harju, N. Jonoska, I. Petre, and Gr. Rozenberg, *The computational nature of gene assembly in ciliates* chapter in Handbook of natural computing Vol. 3 (G. Rozenberg, T. Bäck, J.N. Kok eds) Springer (2012) 1233–1281.
53. M. Anselmo, N. Jonoska, M. Madonia, *Framed versus Unframed Two Dimensional Languages*, SOFSEM 09 (M. Nielsen et al. eds) LNCS **5404** (2009) 79–92.

54. N. Jonoska, G. Wu*, N.C. Seeman, *Existence of single-stranded reporters in DNA-based graph structures* Theoretical Computer Science **410** 15 (2009) 1448–1460 also available online: <http://dx.doi.org/10.1016/j.tcs.2008.12.004>
55. E. Dolzhenko*, N. Jonoska, *On complexity of two dimensional languages generated by transducers* in Implementation and Application of Automata (O. Ibaraa et al eds.) Springer LNCS **5148** (2008) 181–190.
56. N. Jonoska, G. McColm, *Complexity classes for self-assembling flexible tiles* Theoretical Computer Science **410** 4-5 (2009) 332–346.
57. N. Jonoska, L. Kari, K. Mahalingam*, *Involution join and solid codes*, *Fundamenta Informaticae* **86** 1–2 (2008) 127–142.
58. N. Jonoska, R. Twarock, *Blueprints for dodecahedral DNA cages*, J. of Physics A: Mathematical and Theoretical **41** (2008) 304043 (14pp) .
59. N. Jonoska, A. Taormina, R. Twarock, *DNA cages with icosahedral symmetry in bionanotechnology* to appear in Algorithmic Bioprocesses (Condon, A.; Harel, D.; Kok, J.N.; Salomaa, A.; Winfree, E. , eds.) June 2009, p. 141–158.
60. A. Angeleska*, N. Jonoska, M. Saito, L. Landweber, *Strategies for RNA-Guided DNA Recombination*, in Algorithmic Bioprocesses (Condon, A.; Harel, D.; Kok, J.N.; Salomaa, A.; Winfree, E. , eds.) June 2009 p. 83–98.
61. N. Jonoska, *Biomolecular Automata in NanoBioTechnology, Bioinspired Devices and Materials of the Future*, Chapter 11, (S. Oded, I. Levi eds.) Humana Press 2008 p. 267–302.
62. N. Jonoska, G. McColm, *Describing Self-assembly of Nanostructures*, SOFSEM (V. Geffert et al eds.) Springer LNCS **4910** (2008) 66–73.
63. A. Angeleska*, N. Jonoska, M. Saito, L. Landweber, *RNA-Guided DNA Assembly*, *Journal of Theoretical Biology* **248** 4 (2007) 706–720.
64. N. Jonoska, J. Pirnot*, *Finite State Automata Representing Two-dimensional Subshifts*, CIAA 2007 (J. Holub, J. Žd’árek eds.) Springer LNCS **4783** (2007) 277–289.
65. M. Cavaliere*, N. Jonoska, P. Leupold, *DNA Splicing: Computing by Observing* Natural Computing **8** 1 (2009) 157–170. (published online first DOI:10.1007/s11047-007-9062-8)
66. D. Genova*, N. Jonoska, *Defining Structures through Forbidding and Enforcing Constraints* Phisica B **394**, Issue 2, 15 May 2007, 306–310.
67. G. Franco*, N. Jonoska, A. Plass, B. Osborn *Knee Joint Injury and Repair Modeled by Membrane Systems* BioSystems **91** 3 (2008) 473–488.
68. N. Jonoska, G. McColm, *Flexible versus Rigid Tiles*, Unconventional Computers (Gh. Paun et al. eds.) Springer LNCS **4135** (2006) 139–151.
69. N. Jonoska, L. Kari, K. Mahalingam*, *Involution Solid and Join Codes*, Developments in Language Theory, (O.H. Ibarra, Z. Dang eds.) Springer LNCS **4036** (2006) 192–202.
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109. N. Jonoska, S. Suen, *Monocyclic decomposition of Graphs and the Road Coloring Problem*, *Cong. Num.* **110** (1995) 201–209.
110. N.Jonoska, *Sofic Shifts with Synchronizing Presentations*, *Theoretical Computer Science* **158** 1-2 (1996) 81–115.
111. N.Jonoska, T.Head, *Images of Cellular Maps on Sofic Shifts*, *Congressus Numerantium*, **101** (1994) 109–115.
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CONFERENCES AND INVITATIONS :

Short course invitations (series of lectures)

- *Math models for DNA recombination* Leiden Univeristy, March/April 2021.
- *Computing models in, and inspired by, biological systems* Department of Computer Science, University of Verona, Verona, Italy, December 8–18, 2016.

- *Mathematical models for DNA recombination processes* short course Department of Mathematical Sciences, Durham University, Durham UK, June 2–7, 2012.
- *Computing by DNA Self-assembly* School of Formal Methods, Bertinoro, Italy, 2–7 June, 2008.
- *Nanostructures and nanodevices made of DNA* (short PhD course) Faculty of Science, University of Milano - Bicocca, May 5–9, 2008.
- *Biomolecular Computing: Theory and Experiments* (PhD course) Computer Science Department, University of Milano - Bicocca, March 31 – April 15, 2008.
- *DNA Computing: theory and experiments* (short course) - University Rovira i Virgili, Tarragona, Spain, October 2006.
- *Biomolecular Automata* (tutorial) Unconventional Computing - September 2006, York UK.
- *Biomolecular Computing* (short course) Summer School in Complex Systems, Valparaiso, Chile, January 3-10, 2004.
- *Computing with DNA graphs; temptation and challenges* (invited short course) Rovira i Virgili University, Tarragona, Spain (January 2003.)
- *Lectures at the On-going workshop on DNA Computing at Leiden, the Netherlands, June 29-July 4, 1998*

Invited (plenary) one hour lectures, with supported travel (past five years):

- *Algebraic and topological models for DNA recombination* Open University UK, January 19, 2021
- *Rearrangement patterns in a scrambled genome* (plenary lecture) IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology, CIBCB 2020, Viña del Mar, Chile, October 27-29, 2020
- *Algebraic and topological models for DNA recombination*, Workshop on Topology: Identifying Order in Complex Systems, Institute of Advanced Study, Princeton NJ, November 6th 2020.
- *Advancing Science through the Companionship of Mathematics and Biology* Distinguished Professor Lecture at USF, October 24, 2019.
- *Molecular Origami* Georgia Institute of Technology, August 4, 2019.
- *Detecting complexity and patterns in a scrambled genome*, University of York, July 19, 2019.
- *Topology and graph theory in DNA recombination and DNA self-assembly*, CBMS Tuscaloosa AL, May 13–17, 2019.
- *Patterns emerging from a scrambled ciliate genome* BIRS, Workshop on Topology and Knots in Biomolecules, March 22-28, 2019.
- *Detecting complexities in a scrambled genome through spacial graphs*, AMS Special Session on Discrete Models in Mathematical Biology (long lecture), Auburn AL, March 15-18, 2019.
- *Describing self-assembly of molecular nanostructures*, Ålto University, Helsinki, Finland, November 15th, 2018.
- *How biology can incite new ideas in algebra and topology*, Binghamton University, BUGCAT, October 12-13, 2018.
- *The Shape of Computation Machines, Computations and Universality*, Fontainebleau June 25–30, 2018.
- *Patterns in complex chromosome rearrangements* BaMBA, Univ. of California, San Francisco, Nov. 18, 2017.

- *Detecting remarkable complexities and Russian-doll chromosomal nesting in a scrambled genome*, Univ. of California, Davis, Nov. 21, 2017.
- *Patterns emerging from a scrambled ciliate genome*, Magic in Science, Åbo Academy in Turku, Finland, June 2017.
- *Topology in DNA self-assembly and DNA recombination*, Topology of the biomolecular world, AIM workshop in San Jose, CA, July 24–28, 2017.
- *Patterns emerging from a scrambled ciliate genome*, Magic in Science, Computability in Europe, Turku, Finland, June 17, 2017.
- *Using spacial graphs to study DNA recombination*, Politecnico University, Milano, Italy, Dec. 11, 2016.
- *Detecting reoccurring patterns of scrambled genes*, University of Verona, Italy, Dec. 12, 2016.
- *Algorithmic self-assembly and self-similar structures* ICERM workshop: Stochastic Topology and Thermodynamic Limits, Brown University, October 17–21, 2016.
- *Topological graph theory in DNA self-assembly and DNA recombination*, MBI workshop: Topological, Geometric, and Statistical Techniques in Biological Data Analysis, September 12–16, 2016.
- *RNA-guided DNA recombination Through Spatial Graphs*, NIMBioS Investigative workshop: Algebraic Mathematical Biology, July 25–27, 2016
- *Graph Polynomials from DNA Rearrangements* Dagstuhl Seminars: Graph Polynomials: Towards a Comparative Theory, Schloss Dagstuhl, Leibniz-Zentrum für Informatik, Germany, June 12–17, 2016.
- *Computation by Molecular Self-assembly* Florida Polytechnic, FL-MAA sectional meeting, Dec. 4, 2015.
- *Self-similarity and recursion in algorithmic DNA self-assembly*, (colloquium) Abo University in Turku, Finland, November 5, 2015.
- *Computation by molecular self-assembly* Pascal Professor public lecture, University of Leiden, Leiden, The Netherlands, October 27th, 2015.
- *RNA-guided DNA Recombination Through Spatial Graphs*, (colloquium) University of Milano – Bicocca, Milano, Italy, October 15th, 2015.
- *Spatial rigid vertex graphs and RNA-guided DNA rearrangements*, MBI Workshop 1: Geometric and Topological Modeling of Biomolecules, Math Biology Institute, Ohio State University, Columbus, OH, Sept. 28–Oct.2, 2015.

POSTDOCS Mentored:

- Jonathan Burns (2014–2016)
- Giuditta Franco (2007)
- Margherita Ferrari (November 2017 –)
- Hwee Kim (2018 – March 2020)
- Abdulmelik Mohammed (2019 –)
- Jennifer Padilla (2011 – 2014)

THESIS ADVISOR:

Major advisor for PhD dissertations:

- Angela Angeleska (co-mentored with M. Saito) *Combinatorial models for gene rearrangements in ciliates* (graduated May 2009). First appointment: University of Tampa, Assistant Professor, tenure track, currently tenured Associate Professor.
- Jasper Braun, (graduated November 2020) title: *Discrete Models and Algorithms for Analyzing DNA Rearrangements*, First appointment: Harvard Medical School - Boston, postdoc.
- Jonathan Burns, (co-mentored with A. Grinshpan) title: *Recursive Methods in Number Theory, Combinatorial Graph Theory, and Probability* (graduated August 2014). First appointment: joint Princeton University - USF postdoc. Currently a research associate at *Ionic Security*.
- Daniel Cruz, *Hierarchical Self-Assembly and Substitution Rules* (graduated August 2019). First appointment: Georgia Institute of Technology, postdoc.
- Egor Dolzhenko title: *Modeling state transitions with automata* (graduated May 2013). First appointment: University of Southern California (Assistant Research Professor). Currently a research scientist at *Illumina*.
- Lina Fajardo-Gomez, (current student, expected graduation Summer 2022)
- Daniela Genova, title: *Forbidding and enforcing properties in graphs and languages* (graduated July 2007). First appointment: University of North Florida, Assistant Professor (tenure-track), currently tenured Professor.
- Daria Karpenko, title: *Active Tile Self-assembly and Simulations of Computational Systems* graduated May 2015. First appointment QA analyst at *Accusoft*.
- David Kephart, title *Topology, Morphisms and Randomness in the Space of Formal Languages* (graduated June 2005). First appointment: Link Systems (software development).
- Kalpana Mahalingam, title *Involution Codes: with applications to DNA strand design* (graduated July, 2004). First appointment: University of Western Ontario, Postdoctoral associate. Currently: Indian Institute of Technology, Chennai, India, Professor.
- Tilahun Muche, title *Hamiltonian Sets of Polygonal Path in 4-Valent Spatial Graphs* (graduated August 2012). First appointment: Savannah State University, Savannah, GA , tenure-track. Currently tenured Associate Professor.
- Joni Pirno, title: *Recognizable Languages Defined by Two-dimensional Shift Spaces* (graduated October, 2006). First appointment: State College of Florida, Manatee-Sarasota, Associate Professor. Currently tenured Professor.
- Ana Staninska (co-mentored with G. McColm) title *A Theoretical Model for Self-assembly of Flexible Tiles* (graduated May 2007). First appointment: Max-Planck Institute Leipzig, Germany, Postdoctoral associate. Currently AXA Analyst, Cologne, Germany.

Mentor (students with extended visits to USF):

- Matteo Cavaliere - University of Sevilla - Spain (Fall 2003) (graduated 2005)

- Giuditta Franco - University of Verona - Italy (Spring 2005) (graduated Spring 2006) post-doctoral associate Fall 2006.

Co-mentor outside USF and/or External Committee Member/Reviewer

- Phiset Sa-Adryen, New York University - NY *Graph Self-assembly* (co-mentor) 2003
- Gang Wu, New York University - NY topic: *Computation by DNA graph self-assembly*. (co-mentor with N.C. Seeman) 2007
- Banani Chakraborty, New York University - NY topic: *Programmable transducers with DNA tile self-assembly*(co-mentor with N.C. Seeman) 2008.
- Shakhti Balan, Indian Institute of Technology- Chennai, India. (examiner) November 2004
- Elena Loseva, University of Western Ontario - London, Canada (examiner) December 2005
- Eugen Czeizler, University of Turku, Finland (**opponent**) April 2007.
- Pierre Guillon, University of Paris, East, Marne-la-Valée, France (examiner) November 2008.
- Sri L Jeganathan, Indian Institute of Technology- Chennai, India, (examiner) June 2009.
- Serghei Verlan, Université Paris Est - Créteil Val de Marne (Habilitation Thesis examiner) October 22, 2010.
- Jennifer Padilla, joint postdoc (NYU and USF), (co-mentor with N.C.Seeman), 2011–2014.
- Marcella Quadri, University of Camerino, Italy, (reviewer, and examiner) June 2019.
- Brett Stanley, La Trobe University – Victoria, Australia, (external examiner) December 2013.
- Rudi van Vliet, Leiden University, Leiden, the Netherlands (external examiner), September 2015.
- Amirhossein Simjour, University of Western Ontario, Canada, December 1st, 2017.
- Sepinoud Azimi, Åbo Akademi University, Turku, Finland (**opponent**) November 2015.
- Vinay Kumar Gautam, Norwegian University of Science and Technology, Trondheim, Norway, (**opponent**) March 22, 2017.

Masters Thesis Mentor (7 students)

Honors Thesis Mentor (4 students)

Undergraduate and High School Students Research Projects (over 20 students)

SERVICE at USF

Department of Mathematics

- *Advisory Committee*, 2016 – 2018
- *Graduate Admissions Committee*, 2012 – 2014

- *Chair Search Committee*, 2017 – 2018
- *Nagle Lecture Committee*, 2010 – 2012
- *New Appointments Committee*, 2011 – 2013, 2015 – 2017, 2018–2019
- *Graduate Committee*, 2010 – 2012, 2015 –
- *Colloquium Committee*, 2009 – 2010
- **Graduate Admissions Director**, Fall 1999 - 2008
- New Appointments Committee 2005 - 2006
- Chair Search Committee, Spring 2005 - 2006
- Graduate Admissions Committee (chair), 1998 - 2008.
- Advisory Committee 2003-2005.
- New Appointments Committee 2002-2003.
- Colloquium Committee (chair) 1996 - 98.
- Undergraduate Committee 1995-96.
- Various ad-hoc Committees

College of Arts and Sciences

- Faculty Advisory Council 2013 – 2019
- SNSM Computational Science Search Committee, 2012–2013
- Faculty Development Committee 2009 – 2011
- Graduate Committee, 2003-2007 (Chair 2005 - 2007).
- New Appointments Committee for Biology Department, 1999-2000

University

- Faculty Senate 2020 – 2023
- Genomic search for Assistant Research Professor 2019 – 2020
- USF Research Council 2011 – 2014
- USF Graduate Council 2013 – 2014