03/31/2025

Konstantinos Mamis

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Employment

2022-present **Acting Instructor,** Department of Applied Mathematics, University of Washington. Mentor: I. Bozic

2021-2022 **Postdoctoral researcher,** Department of Mathematics, North Carolina State University. Mentor: M. Farazmand

2020-2021 **Postdoctoral researcher,** Mathematical Modeling & Applications Laboratory, Hellenic Naval Academy. Mentor: G. Galanis

Education

2020 **PhD in Stochastic Dynamics,** National Technical University of Athens (NTUA)
Thesis title: Probabilistic responses of dynamical systems subjected to Gaussian colored noise excitation. Foundations of a non-Markovian theory

2015 **MSc in Mathematical Modeling in Modern Technologies & Economics (first of class),** NTUA
Thesis title: Exact stationary probabilistic solutions to stochastic dynamical systems by solving the Fokker-Planck-Kolmogorov equation with splitting techniques

2013 **Diploma in Naval Architecture & Marine Engineering (first of class),** NTUA
Thesis title: Modeling and Analysis of Hydro/Piezo/Electric Systems

Awards and Honors

Pacific Institute of the Mathematical Sciences (PIMS) -Simons Postdoctoral Fellowship 2023-2025

Thomaïdeio award for publication as PhD candidate (2016, 2018, 2019), master's student (2015), undergrad (2013)

ELKE NTUA scholarship as PhD candidate 2015-2019

IKY fellowship of excellence for postgraduate studies in Greece-Siemens program 2013-2015

Thomaïdeio award for best diploma thesis in NTUA of the year 2013

Limmat Stiftung Award for graduating 1st from School of Naval Architecture & Marine Engineering, class of 2013

Award in memory of Prof. Christos Papakyriakopoulos for distinction in NTUA math courses of 2008-2009

Publications

Preprints

16. G. Athanassoulis, N. Nikoletatos-Kekatos, K. Mamis "A systematic path to non-Markovian dynamics II: Probabilistic response of nonlinear multidimensional systems to Gaussian colored noise excitation" arXiv.2405.10236

15. K. Mamis, I. Bozic "Early-stage cancer results in a multiplicative increase in cell-free DNA originating from healthy tissue" https://doi.org/10.1101/2024.01.26.577500

14. K. Mamis “New formulas for moments and functions of the multivariate normal distribution extending Stein's lemma and Isserlis theorem” arXiv.2202.00189

Journal Articles

13. K. Mamis, M. Farazmand (2024) “Modeling correlated uncertainties in stochastic compartmental models”, *Mathematical Biosciences,* 374, 109226.

12. K. Mamis, R. Zhang, I. Bozic (2023) “Stochastic model for cell population dynamics quantifies homeostasis in colonic crypts and its disruption in early tumorigenesis”, *Proceedings of the Royal Society B,* 290, 20231020.

11. K. Mamis, M. Farazmand (2023) “Stochastic compartmental models of COVID-19 pandemic must have temporally correlated uncertainties”, *Proceedings of the Royal Society A*, 479, 20220568.

10. K. Mamis (2022) “Extension of Stein’s lemma derived by using an integration by differentiation technique”, *Examples and Counterexamples,* 2, 100077.

9. K. Mamis, M. Farazmand (2021) “Mitigation of rare events in multistable systems driven by correlated noise”, *Physical Review E,* 104, 034201.

8. K.I. Mamis, G.A. Athanassoulis, Z.G. Kapelonis (2019) “A systematic path to non-Markovian dynamics: New response probability density function evolution equations under Gaussian coloured noise excitation”, *Proceedings of the Royal Society A*, 471, 20180837.

7. G.A. Athanassoulis, K.I. Mamis (2019) “Extensions of the Novikov-Furutsu theorem, obtained by using Volterra functional calculus”, *Physica Scripta*, 94(11) 115217.

6. K.I. Mamis and G.A. Athanassoulis (2016) “Exact stationary solutions to Fokker-Planck-Kolmogorov equation for oscillators using a new splitting technique and a new class of stochastically equivalent systems”, *Probabilistic Engineering Mechanics,* 45, 22-30.

5. G.A. Athanassoulis and K.I. Mamis (2013) “Modeling and analysis of a cliff-mounted piezoelectric sea-wave energy absorption system”, *Coupled Systems Mechanics,* 2(1), 53-83.

Peer-Reviewed Conference Proceedings

4. K.I. Mamis, G.A. Athanassoulis & K.E. Papadopoulos (2018) “Generalized FPK equations corresponding to systems of nonlinear random differential equations excited by colored noise. Revisitation and new directions”, *Procedia Computer Science*, 136(C), 164–173.

3. G.A. Athanassoulis, Z.G. Kapelonis & K.I. Mamis (2018) “Numerical solution of generalized FPK equations corresponding to random differential equations under colored noise excitation. The transient case”, *8th Conference on Computational Stochastic Mechanics*. Paros, Greece.

2. K.I. Mamis and G.A. Athanassoulis (2016) “Quantifying the influence of Wong-Zakai correction on a class of exactly solvable generalized Dimentberg oscillators”, *11th HSTAM International Congress on Mechanics: Advances in Theoretical and Applied Mechanics.* Athens, Greece.

1. K.I. Mamis and G.A. Athanassoulis (2015) “Exact stationary solutions to a class of non-linear stochastic oscillators. Establishing new benchmark cases for testing numerical solution schemes”, *Procedia Computer Science,* 66, 33-42.

Teaching Experience

Instructor

Sp2025	Introduction to Continuous Mathematical Modeling (AMATH 383), University of Washington
W2025	Undergraduate Reading and Research (AMATH 499), University of Washington
W2025	Seminar in Biology (BIO/BIS 285), University of Washington *(co-instructor)*

Sp2024	Mathematical Modeling of Cancer (AMATH 536), University of Washington
Sp23, W24, W25	Introduction to Differential Equations and Applications (AMATH 351), University of Washington
Sp2022	Introduction to Finite Mathematics and Applications (MA 114), North Carolina State University

Teaching assistant

2015-2019	Stochastic Modeling of macroscopic phenomena and processes, NTUA
2015-2019	Mathematical Modeling of the continuum, NTUA
2015-2019	Fluid Mechanics, NTUA

Contribution to lecture notes

Stochastic Modeling and Prediction of Marine Systems, MSc Program “Marine Science & Technology Management”

Advising

2023-present	Supervision of three undergrad research projects, University of Washington
2021-2022	Co-supervision of one master thesis in MSc Program “Marine Science & Technology Management”
2017-2020	Assistance in supervision of three diploma theses, NTUA

Funding

2023-2025	PIMS-Simons PDF travel funding ($10,000)
2025	Grant for participation in Joint Mathematics Meetings ($430)
2024	Travel grant for participation in Maud Menten Institute HQP Summit ($800)
2024	Travel grant for participation in Master Class in Teaching Math Modeling for Life Science ($1,500)
2023	Travel grant for participation in MathOnc23 Conference ($1,000)
2015	IKY-Siemens travel funding for participation in Wave propagation in complex media (€1,000)

Invited Talks

2025

- University of Wyoming, Math Department colloquium
- Augusta University, Math Department colloquium
- Joint Mathematics Meetings, AMS Special session on dynamical systems modeling approaches across multiple biological scales

2024

- Fred Hutch Cancer Center math modeling affinity group
- Emergent Research: PIMS postdoctoral fellow seminar
- Western Washington University, Department of Mathematics colloquium

2023

- University of British Columbia, Math Bio seminar
- SIAM PNW Conference, Minisymposium on mathematical modeling for the quantification of biological phenomena
- University of Washington, Applied Math seminar

2022

- University of Washington, Probability seminar
- Conference in honor of Prof. G.A. Athanassoulis upon his retirement
- University of California Riverside, Applied math seminar

2021

- Stanford University, Prof. Tartakovsky's group meeting
- North Carolina State University, RTG meeting

2020

- Weierstrass Institute, Mathematical Models in Photonics seminar
- Rio de Janeiro State University, Nucleus of Modeling and Experimentation with Computers

Contributed talks

2023 *A simple stochastic model for cell population dynamics in colonic crypts*, MathOnc23 Conference. Phoenix AZ.

2021 *Effect of correlated noise on multistable systems with time-delay feedback control*, 46th Conference of the Middle European Cooperation in Statistical Physics. Riga, Latvia.

2019 *Formulation and solution of response pdf evolution equations corresponding to systems under Gaussian coloured noise excitation*, 3rd International Conference on Uncertainty Quantification in Computational Sciences and Engineering. Heraklion, Greece.

Poster Presentations

2024 *A simple stochastic model for cell population in colonic crypts: homeostasis and its disruption in early tumorigenesis*, Maud Menten Institute Highly Qualified Personnel Summit and Working Group Meetings. Vancouver, BC.

2019 *Determining the probabilistic structure of the response to a nonlinear dynamical system under coloured noise excitation*, 44th Conference of the Middle European Cooperation in Statistical Physics. Munich, Germany.

2018 *Generalized (non-Markovian) FPK equations corresponding to nonlinear random differential equations excited by colored noise. Hänggi's ansatz revisited*, 43rd Conference of the Middle European Cooperation in Statistical Physics. Kraków, Poland.

Other Research and Educational Experience

2024-2025 Science Teaching Experience Program-Working in Science Education, University of Washington.

S2024 Master Class in Teaching Math Modeling for Life Science, Harvard University.

S2023 UW Teaching Online 101 course.

2020-2021 Development of sonar simulator, Hellenic Navy research project, conducted by the Hellenic Naval Academy, the School of Naval Tactics, and the Naval Combat Systems Automation Center.

05-08/2012 Salaried position in the research program Offshore Energy Mapping for Northeast Atlantic and Mediterranean, MARINA PLATFORM project.

2010 International and Interdisciplinary IPY Polar Field School, Longyearbyen, Svalbard, Norway.

Service

Reviewer for: Europhysics Letters, Chaos solitons and fractals, Communications in Statistics –Theory and Methods, International Journal of Offshore & Polar Engineering, Journal of Physics A: Mathematical & Theoretical, Journal of Vibration Engineering & Technologies, Mathematical Biosciences & Engineering, Mechanical Systems & Signal Processing, Nonlinear Dynamics, Physica Scripta, Physical Review E, PLOS Computational Biology, Probability Engineering Mechanics, Proceedings of the Royal Society A, Rapid Reviews\Infectious Diseases, Stochastic Models.

- IOP Trusted Reviewer status, Institute of Physics.
- Co-organizing the minisymposium "Mathematical modeling for the quantification of biological phenomena" at the 2023 SIAM PNW Conference, Bellingham WA.
- Organizing and managing speaker schedule for Boeing Distinguished Colloquium, University of Washington (2023-4).
- Member of the organizational and scientific committee of the Conference in honor of Prof. G. A. Athanassoulis upon his retirement, July 4-5 2022, Athens, Greece.
- Help in launch of new MSc Program "Marine Science & Technology Management" organized by the Hellenic Naval Academy and the University of Piraeus, 2020-2021.
- Help in organization of 4th International Young Scientists Conference and Summer School on NTUA campus, 2015.