ACADEMIC CURRICULUM VITAE (C.V)

PERSONAL DETAILS
Full Name: Nikolaos Kolliopoulos
Date of Birth: 02/21/1990
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CONTACT DETAILS
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Areas of specialization: Stochastic Analysis, Differential Equations, Probability, Mathematical Finance.

Main research interests: Interacting Particle Systems: well-posedness and large population asymptotics. The later includes the study of propagation of chaos properties in systems with mean-field interaction and the analysis of SPDEs describing empirical measure limits. Systems of interest include portfolio models for credit risk, interbanking network models and mean-field games among investors.

Other topics of interest: Working and past papers have some exposure to: Extreme Value Theory, Nonlinear PDEs, Backward SPDEs (BSPDEs), Stochastic Flows and Malliavin Calculus.

ACADEMIC POSITIONS

08/2023 – Present: **Department of Mathematics, University of Michigan.**
Position: Postdoctoral Assistant Professor (Mentor: Prof. Erhan Bayraktar).

01/2021 – 06/2023: **Department of Mathematical Sciences, Carnegie Mellon University (CMU).**
Position: Postdoctoral Associate (Mentor: Prof. Martin Larsson).

01/2020 – 10/2020: **Beijing International Centre for Mathematical Research (BICMR), Peking University.**
Position: Postdoctoral Research Fellow (Mentor: Prof. Ying Jiao).

EDUCATION

10/2014 – 03/2019: **Centre for Doctoral Training (CDT) in Partial Differential Equations: Analysis and Applications, Mathematical Institute, University of Oxford.**
Degree awarded: Doctor of Philosophy (D.Phil).
Thesis: «Analysis of Stochastic PDEs arising from large portfolios of stochastic volatility models».
(Supervisor: Prof. Ben Hambly).

10/2008 – 7/2013: **School of Applied Mathematical and Physical Sciences, National Technical University of Athens.**
Degree awarded: Diploma equivalent to BA + Masters (300 Ects), **Final grade:** 9.02/10 (Excellent).
Specializations: Pure and Applied Mathematical Analysis, Probability and Statistics.
Diploma thesis: «Theoretical and Numerical pricing of Financial Derivatives»
(Supervisor: Prof. Michail Loulakis).

GRANTS, FELLOWSHIPS AND PRIZES

U.S National Science Foundation (NSF) Grant DMS-2406232. Award title: Extreme Value Theory for diffusive particle systems with mean-field interaction. **08/2024 – 07/2027**

Boya Postdoctoral Fellowship of Peking University. **01/2020 – 10/2020**

G-Research PhD prize in Maths and Data Science (awarded every year to a few Oxbridge PhD students). **02/2018**

Scholarship in the memory of Karolos Trivizas from the Foundation for Education and European Culture. Foundation website: www.ipep-gr.org. **10/2017 – 06/2018**

External support to researchers working at the Mathematical Finance group of Oxford University **01/2016 – 05/2016**

Engineering and Physical Sciences Research Council (EPSRC) studentship. **10/2014 – 06/2018**

PUBLICATIONS, PREPRINTS AND WORKING PAPERS

[1] Kolliopoulos, Nikolaos; Sanchez, David; Xiao, Amy. Large-population asymptotics for the maximum of diffusive particles with mean-field interaction in the noises. Statistics & Probability Letters 212, 110150 (2024). (Link: https://www.sciencedirect.com/science/article/pii/S0167715224001196)

[2] Hambly, Ben and Kolliopoulos, Nikolaos. Stochastic PDEs for large portfolios with general mean-reverting volatility processes. Probability, Uncertainty and Quantitative Risk, 1-38 (2024). (Link: https://www.aimsciences.org/article/id/664b05c7abc893368bc62dee).

[3] Kolliopoulos, Nikolaos; Larsson, Martin and Zhang, Zeyu. Propagation of chaos for point processes induced by particle systems with mean-field drift interaction. Submitted (2024). (ArXiv preprint: https://arxiv.org/abs/2303.11426)

[4] Kolliopoulos, Nikolaos; Larsson, Martin and Zhang, Zeyu. Propagation of chaos for maxima of particle systems with mean-field drift interaction. Probability Theory and Related Fields 187 (3), 1093-1127 (2023). (Link: https://link.springer.com/article/10.1007/s00440-023-01213-9)

[5] Jiao, Ying and Kolliopoulos, Nikolaos. Well-posedness of a system of SDEs driven by jump random measures. Stochastics and Dynamics 23 (04), 2350028 (2023). (ArXiv preprint: https://arxiv.org/abs/2102.03918)

[6] Hambly, Ben and Kolliopoulos, Nikolaos. Fast mean-reversion asymptotics for large portfolios of stochastic volatility models. Finance and Stochastics 24 (3), 757-794 (2020). (Link: https://link.springer.com/article/10.1007/s00780-020-00422-7).

[7] Hambly, Ben and Kolliopoulos, Nikolaos. Stochastic Evolution Equations for large portfolios of Stochastic Volatility models. SIAM Journal on Financial Mathematics 8 (1), 962-1014 (2017). See also erratum below. (ArXiv preprint: https://arxiv.org/abs/1701.05640).

[7 - Erratum] Hambly, Ben and Kolliopoulos, Nikolaos. Erratum: Stochastic Evolution Equations for large portfolios of Stochastic Volatility models. SIAM Journal on Financial Mathematics 10 (3), 857-876 (2019). (ArXiv preprint: https://arxiv.org/abs/1905.04397).

[8] Kolliopoulos, Nikolaos. On the extreme value distributions of diffusive processes. Working paper.

[9] Bayraktar, Erhan and Kolliopoulos, Nikolaos. On the upper order statistics of large diffusive games and systems with drift control and general drift interaction. Working paper.

INVITED TALKS

01/2024: **Finance and Risk Engineering Department Seminar, Tandon School of Engineering, New York University.**
Title: "Extreme Value Theory for diffusive particle systems with mean-field interaction"

10/2023: **Financial and Actuarial Mathematics Seminar, Department of Mathematics, University of Michigan.**
Title: "Extreme Value Theory for particle systems with mean-field drift interaction"

06/2023: **SIAM Conference on Financial Mathematics and Engineering (FM23), Philadelphia, USA.**
Title: "Propagation of chaos for maxima of particle systems with mean-field drift interaction"

02/2023 **Financial and Actuarial Mathematics Seminar, Department of Mathematics, University of Michigan.**
Title: "Propagation of chaos for maxima of particle systems with mean-field drift interaction and applications in Finance"

01/2023: **Seminar, School of Applied Mathematical and Physical Sciences, National Technical University of Athens.**
Title: "Asymptotic behaviour of extreme values in large interacting particle systems via propagation of chaos"

10/2022: **6th Eastern Conference on Mathematics Finance, Rutgers University.**
Title: "Propagation of chaos for maxima of particle systems with mean-field drift interaction"

07/2022: **CDT in PDEs Reunion Event (organized along with the International PDE Conference), University of Oxford.**
Title: "Propagation of chaos for maxima of particle systems with mean-field drift interaction"

03/2022: **Probability and Math. Finance Seminar, Department of Mathematical Sciences, Carnegie Mellon University.**
Title: "Propagation of chaos for maxima of particle systems with mean-field drift interaction"

03/2021: **Probability and Math. Finance Seminar, Department of Mathematical Sciences, Carnegie Mellon University.**
Title: "Fast mean-reverting volatility asymptotics in large portfolio modeling"

09/2020: **Probability Seminar, School of Mathematical Sciences, Peking University.**
Title: "Fast mean-reverting volatility asymptotics in large portfolio modeling"

06/2018: **1st Congress of Greek Mathematicians (celebrating 100 years of Hellenic Mathematical Society), University of Athens.**
Title: "Stochastic PDEs arising from large portfolios of stochastic volatility models"

CONTRIBUTED TALKS

06/2022: **11th World Congress of the Bachelier Finance Society (held remotely).**
Title: "Propagation of chaos for maxima of particle systems with mean-field drift interaction"

05/2020: **13th International Workshop on Rare Event Simulation, Paris.**
Title: "Fast mean-reversion asymptotics for large portfolios of stochastic volatility models"
(poster presentation of my same-titled article, published in "Finance and Stochastics" - **cancelled due to Covid-19**).

06/2017: **Interacting systems and SPDEs conference, University of Sheffield.**
Title: "Stochastic evolution equations for large portfolios of stochastic volatility models"

04/2017: **ICMS Joint CDT colloquium, University of Edinburgh.**
Title: "Stochastic evolution equations for large portfolios of stochastic volatility models"

TEACHING, MENTORING AND TEACHING ASSISTANTSHIP

University of Michigan:

MATH 423: Mathematics of Finance (Instructor) **Fall 2023 and Winter 2024**

MATH 573: Financial Mathematics I (Instructor) **Fall 2024 (Current Semester)**

MATH 399 – 272: Independent Reading **Summer 2024**
(Supervised multiple undergraduate students in a small coding project that involved the numerical verification of a few simple research questions associated with the award NSF DMS-2406232, including a female student and a male student with Hispanic origin).

Carnegie Mellon University:

Supervision of undergraduate equity-focused novel research project **Spring 2023**
(Guided two undergraduate students who worked together on a novel research problem: a female student via an undergraduate research course, and a male Federal Work-Study eligible student via a paid undergraduate research program).
Project topic: Propagation of chaos for maxima of a Gaussian particle system with mean-field interaction in the noises: weak convergence and numerical simulations.

21-325 Probability (Instructor) **Spring 2023**

21-122 Integration and Approximation (Instructor) **Fall 2022**

Summer Undergraduate Research Apprenticeship (SURA) **Summer 2022**
(Supervision of two undergraduates conducting summer research)
Project topic: Lookback option pricing under the Black-Scholes model (analytically and numerically)

21-260 Differential Equations (Instructor) **Spring 2021, 2022**

21-259 Calculus in 3 Dimensions (Instructor) **Fall 2021**

University of Oxford:

MSc MF (part time): Module 2 – Black-Scholes Theory (Problem class tutor) **Hilary 2017**

B8.2 Continuous Martingales and Stochastic Calculus (Teaching Assistant) **Hilary 2016**

B8.3 Mathematical Models of Financial Derivatives (Teaching Assistant) **Hilary 2016, 2017**

B8.4 Communication Theory (Teaching Assistant) **Michaelmas 2016**

Stanford Tutoring (Tutorials to visiting Stanford University undergraduates) **Trinity 2016 - Trinity 2017**
Subjects taught: Real Analysis, Complex Analysis, Ito Calculus, Markov Chains.

MSc MCF: Introduction to Stochastic Control (Grader) **Hilary 2017**

National Technical University of Athens:

IMC (International Mathematics Competition for University Students) Training Classes **Summer 2012**
(Tutor of a few problem classes for other members of the University's IMC team)

OUTREACH

03-05/2023: **Tutoring in Math Circle for PA school students preparing for the American Regions Mathematics League (ARML)**
(Training involved attempting tests from previous years and other Olympiad-style mathematical problems aiming to enhance critical thinking)

11/2022: **Participation in the SIAM Student Chapter Postdoc Panel**
(A panel where graduate students and postdocs will share their experiences and advise younger students on their academic development)

04/2022: **Research talk at the Graduate Student and Postdoc Seminar (GSPS)**
(A seminar organized by postdocs working in the Department of Mathematical Sciences of Carnegie Mellon University that aims to the engagement of early-stage graduate students in novel research).

2012 - Present **Participation in various activities of the Hellenic Mathematical Society**
(An organization funded by its members that aims to the promotion of Mathematics all around Greece)

IT SKILLS

Programming Languages:
- **C++**
- **Java**
- **Fortran**

Mathematical Software:
- **Matlab**
- **R**
- **Wolfram Mathematica**

Mathematical text writing: **Latex**

AWARDS IN MATHEMATICAL COMPETITIONS / OLYMPIADS

International Mathematics Competition for University Students (IMC)

2012, 2013: **Second Prize** (Ranked in the top 33% of all the participants).

2009 – 2011: **Third Prize** (Ranked in approximately the top 40% of all the participants in 2010 and 2011).

South Eastern European Mathematical Olympiad for University Students (SEEMOUS)

2010: **Silver Medal** (Ranked in the top 33% of all the participants).

LANGUAGES

English, Fluent:

- Nearly 2 years working in the US (Jan. 2021 – Present).
- Nearly 4 years living in the UK for doctoral studies (Oct. 2014 – Jun. 2018).
- IELTS Band score 6.5 (Dec. 2013).

Greek, Fluent: Native Language.