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, Partial Differential Equations (PDEs), 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).

STUDIES

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).
Study structure:
Year 1: Attended graduate and research classes on PDE Analysis, Stochastic Analysis and Nonlinear Analysis, weekly PDE seminars, and worked on a few small research projects.
Years 2-4: Conducted research towards the completion of a D.Phil thesis (defended on 12/17/2018).
D.Phil thesis topic: «Analysis of Stochastic PDEs arising from large portfolios of stochastic volatility models».
D.Phil 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. Also attended classes on Combinatorics, Algorithms and Complexity, Number Theory and Graph Theory.
Diploma thesis topic: «Financial Derivatives pricing» (Asian and Lookback options pricing, both analytically and with advanced Monte Carlo techniques).
Diploma thesis supervisor: Prof. Michail Loulakis.

PUBLICATIONS, PREPRINTS AND WORKING PAPERS

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

[2] Kolliopoulos, Nikolaos; Larsson, Martin and Zhang, Zeyu. Propagation of chaos for maxima of particle systems with mean-field drift interaction. To appear in Probability Theory and Related Fields. (ArXiv: https://arxiv.org/abs/2206.10018)

[3] Jiao, Ying and Kolliopoulos, Nikolaos. Well-posedness of a system of SDEs driven by jump random measures. Stochastics and Dynamics, Vol 23 (No. 4). (ArXiv: https://arxiv.org/abs/2102.03918)

[4] Hambly, Ben and Kolliopoulos, Nikolaos. Fast mean-reversion asymptotics for large portfolios of stochastic volatility models. Finance and Stochastics, Vol 24 (Issue 3), pp. 757–794 (38 pages). (ArXiv: https://arxiv.org/abs/1811.08808).

[5] Hambly, Ben and Kolliopoulos, Nikolaos. Stochastic Evolution Equations for large portfolios of Stochastic Volatility models. SIAM Journal on Financial Mathematics, Vol. 8 (Issue 1), pp. 962-1014 (53 pages). See also erratum below. (ArXiv: https://arxiv.org/abs/1701.05640).

[5 - Erratum] Hambly, Ben and Kolliopoulos, Nikolaos. Erratum: Stochastic Evolution Equations for large portfolios of Stochastic Volatility models. SIAM Journal on Financial Mathematics, Vol. 10 (Issue 3), pp. 857–876 (20 pages). (ArXiv: https://arxiv.org/abs/1905.04397).

[6] Hambly, Ben and Kolliopoulos, Nikolaos. Stochastic PDEs for large portfolios with general mean-reverting volatility processes. Submitted. (ArXiv: https://arxiv.org/abs/1906.05898).

[7] Kolliopoulos, Nikolaos. On the extreme value distributions of diffusive processes. Working paper (some strong results have already been obtained).

FELLOWSHIPS, GRANTS AND AWARDS

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**

INVITED TALKS

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 **Regular Seminar, Department of Mathematics, University of Michigan (held remotely).**
Title: "Propagation of chaos for maxima of particle systems with mean-field drift interaction and applications in Finance"

01/2023: **Regular 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 and Winter 2023** **(Current and Next Semester)**
Math 472: Numerical Methods with Financial Applications (Instructor)	**Winter 2023** **(Next Semester)**

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)
<u>**Project topic:**</u> 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**

<u>**University of Oxford:**</u>

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**
<u>**Subjects taught:**</u> Real Analysis, Complex Analysis, Ito Calculus, Markov Chains.

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

<u>**National Technical University of Athens:**</u>

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)

<u>**OUTREACH**</u>

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 certain activities of the Hellenic Mathematical Society**
(An organization funded by its members that aims to the promotion of Mathematics all around Greece)

<u>**IT SKILLS**</u>

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.