Erida Gjini **CURRICULUM VITAE** **2024**

CONTACT

Center for Computational and Stochastic Mathematics
Department of Mathematics, Instituto Superior Tecnico
University of Lisbon, Av. Rovisco Pais, 1049-001
Lisbon, Portugal

Phone: +351 218 419 753
Email: gjini.erida@gmail.com
erida.gjini@tecnico.ulisboa.pt
URL: Website, RG, GScholar
ORCID

KEYWORDS

Applied mathematics, mathematical biology, probability theory and stochastic processes, statistical inference, multi-species interactions, biodiversity, infectious disease epidemiology, ecology and evolution, antibiotic resistance, ordinary differential equations and dynamical systems.

EMPLOYMENT

2020 -
Researcher in Applied Mathematics, Instituto Superior Tecnico, Lisbon, Portugal
Invited Assistant Professor, Department of Mathematics, IST (2021 - 2022)
2023 -
Invited Assistant Professor, Department of Mathematics, Lisbon School of Economics and Management (ISEG), Lisbon
2021
Invited Assistant Professor, Department of Mathematics, ISCTE, Lisbon
2015 - 2020
Principal Investigator, Instituto Gulbenkian de Ciência
(*Mathematical Modeling of Biological Processes Group*), Portugal
2012 - 2015 Postdoctoral researcher, (*Collective Dynamics Group*, PI: Dr. Gabriela Gomes)
Instituto Gulbenkian de Ciência, Portugal

EDUCATION

Ph.D., **Mathematics** (2007-2012) University of Glasgow, Glasgow, UK

M.Sc., **Mathematical Sciences** (2005-2007) University of Utrecht, The Netherlands

B.Sc., **Science (Liberal Arts)**, (2002-2005) Utrecht University College, The Netherlands

International Baccalaureate (IB) (2000-2002) United World College, Trieste, Italy

SELECTED ADVANCED TRAINING AND RESEARCH VISITS

- **April-June 2021** Visiting researcher at LE STUDIUM, Loire Valley Institute for Advanced Studies, Tours, France (*coexistence near neutrality*)
- **November 2019** 3 week research visit at Department of Chemistry and Biophysics, University of Michigan, Ann Arbor, USA (*antibiotic resistance* Dr. Kevin Wood Lab)
- **April 2019** 1 month research visit as Invited Researcher at the University of Tours, France (EURAXESS) (*Department of Mathematics, host: Dr. Sten Madec*)
- **October 2017** Research visit at Department of Chemistry and Biophysics, University of Michigan, Ann Arbor, USA (*antibiotic resistance, Dr. Kevin Wood Lab*)
- **June 2016** ESCMID Individualized Medicine in Infectious Diseases, Tubingen, Germany
- **March 2016** Visiting researcher at NIMBIOS, University of Tennessee, USA (*theoretical immunology lab: Dr. Vitaly Ganusov*)

FUNDING AND GRANTS

- **2022 FCT project** 2022.03060.PTDC Models4Invasion: *218K EUR* (2023-2026)
- **2021 FLAD student funding** awarded to T. Freire for project under my supervision
- **2021 Visiting Researcher** at LE STUDIUM, Institute for Advanced Studies, Loire Valley
- **FCT** PESSOA grant 2020 for collaboration with Sten Madec, U. Tours, France (*2000 EUR*)
- **FCT** CEECIND/03051/2018 Stimulus of Scientific Employment, Individual Support Call

- **SMB conference organizer award**: *5000 USD* for Tirana Computational and Mathematical Biology Workshop (2018),from Society for Mathematical Biology (USA)
- **The Company of Biologists (UK) Workshop grant for:** Tirana Computational and Mathematical Biology Workshop (2018), as Coordinator and main organizer in collaboration with Albanian Academy of Sciences and University of Tirana. (*amount 3500 GBP*)
- **FLAD-NSF grant 274/2016:** Exploring population density-dependent feedbacks in synthetic bacterial infection systems under antibiotic treatment, as Principal Investigator in collaboration with Prof. Kevin Wood, at University of Michigan (USA) (*amount 8750 EUR*) by Fundacão Luso-Americana para o Desenvolvimento, Portugal
- **Short-term visit grant** by NIMBioS, Knoxville, Tennessee, USA, March 2016 *(1000 USD)*

Selected projects

1. FCT project 2022.03060.PTDC, as Principal Investigator. Models4Invasion (2023-2026), in collaboration with Sten Madec (France)
2. Exploring population density-dependent feedbacks in synthetic bacterial infection systems under antibiotic treatment, (as PI) in collaboration with Dr. Kevin Wood, at University of Michigan (USA) 2017- 2019
3. Interactions and coexistence in microbial ecosystems, (as PI), in collaboration with Dr. Sten Madec, University of Tours (France) 2016 - ongoing
4. Host immunity and antibiotic resistance in treatment dynamics of acute and chronic infection, (as PI) with Dr. Vitaly Ganusov, University of Tennessee (USA) 2016-2020

Selected teaching

PhD level

- Systems Biology Module (1 week), IBB PhD programme, IGC. (May, Nov. 2017)
- Introduction to Mathematical Modelling for Epidemiology and Medicine IBB PhD Programme, IGC, Portugal (April 2016)
- Mathematical Epidemiology, Graduate program Science for Development (PGCD), Cabo Verde (July 2014)

Master level

- Mathematical Models in Biomedicine, Master Course, Department of Mathematics, Instituto Superior Tecnico **(Invited Assistant Professor**, 2021- 2023)
- Computational Biology in the Biomedical Practice, with Dr. Claudine Chaouiya, Faculty of Sciences, University of Lisbon, Portugal (March-April 2017)

Undergraduate level

- Statistics, Dept. Mathematics, ISEG, Lisbon (**Inv. Assistant Professor**) 2023
- Optimization, Dept. Mathematics, ISCTE, Lisbon (**Inv. Assistant Professor**) 2021
- *2007-2011* (University of Glasgow, UK)
  Mathematics 1R: Algebra and Differential Calculus (**Tutor**);
  Mathematics 1S: Algebra and Differential Calculus (**Tutor, Marker**);
  Mathematics 2C: Topics in Applied Mathematics (**Tutor/Teaching assistant**);
  Mathematical Ecology (Level 3 course for Biology students) (**Tutor**)

Student supervision

8 MSc students (2014-2023) and 2 PhD students: one in co-supervision, France, graduated in 2021; another ongoing at IST.

Organization of scientific meetings

- Symposium organizer: Models4Life Symposium (Virtual meeting June 2021) hosted by the Albanian Academy of Sciences, Tirana, Albania
- Workshop organizer: 1st Tirana Mathematical and Computational Biology Workshop (October 2018), in collaboration with Albanian Academy of Sciences and University of Tirana
- Member of the local organising committee of the European Conference of Mathematical and Theoretical Biology (ECMTB 2018) July 2018 in Lisbon, Portugal (Mentorship Programme)

Professional service

Refereeing for scientific journals:

- PNAS, Nature Communications, Microbiology, Epidemics, Journal of Royal Society Interface Focus, Bulletin of Mathematical Biology, Theoretical Population Biology, Computers and Mathematics with Applications, Journal of Mathematical Biology, PLOS Computational Biology, PLOS ONE, Mathematical Biosciences, Journal of Theoretical Biology

Grant reviewing for scientific organisations:

- European Commission Reviewing Expert
- NWO, Netherlands National Science Foundation (Earth and Life Sciences Panel)
- European Science Foundation (ESF)

Selected Publications (out of 30)

10. **Gjini E.** and Madec S. (2023) Towards a mathematical understanding of invasion resistance in multispecies communities Royal Society Open Science, doi:10.1098/rsos.231034
9. Le, T. M. T., Madec, S., **Gjini E.** (2022). Disentangling how multiple traits drive 2 strain frequencies in SIS dynamics with coinfection. Journal of Theoretical Biology, 538
8. Ramos G, **Gjini E.**, Coelho L, Silveira M. (2021) Unsupervised learning approach for predicting sepsis onset in ICU patients. Annu Int Conf IEEE Eng Med Biol Soc. 2021 Nov;2021:1916-1919.
7. **Gjini E.** and Wood K. B. (2021) Price equation captures the role of drug interactions and collateral effects in the evolution of multidrug resistance, *eLife* DOI: 10.7554/elife.64851
6. **Gjini E**, and Madec, S. (2021) The ratio of single to co-colonization is key to complexity in interacting systems with multiple strains (DOI: 10.1002/ece3.7259, Ecology and Evolution, pdf)
5. Madec S. and **Gjini, E.** (2020) Predicting N-strain coexistence from co-colonization interactions: epidemiology meets ecology and the replicator equation *Bulletin of Mathematical Biology* 82, 142. (pdf)
4. **Gjini E.** (2017) Geographic variation in pneumococcal vaccine efficacy estimated from dynamic modeling of epidemiological data post-PCV7. *Nature Scientific Reports* 7:3049, (pdf)
3. **Gjini E.**, Brito P. (2016) Integrating antimicrobial therapy with host immunity to fight drug-resistant infections: classical vs. adaptive treatment, *PLOS Computational Biology* (pdf)
2. **Gjini E.**, Valente C., Sa-Leao R., Gomes, M.G.M. (2016) How direct competition shapes coexistence and vaccine effects in multi-strain pathogen systems. *Journal of Theoretical Biology* 388:50-60 (pdf)
1. **Gjini, E.**, Haydon, D.T., Barry, J.D. and Cobbold, C.A. (2010) Critical Interplay between Parasite Differentiation, Host Immunity, and Antigenic Variation in Trypanosome Infections. *American Naturalist*, 176 (4). pp. 424-439. (pdf)

Selected Talks

12. Spatial modeling of multi-drug resistance, DSABNS 2023, Bilbao, Spain, February **2023**
11. Coexistence near neutrality, LE STUDIUM 25 years Conference, Understanding, preserving and improving the world around us, Orleans, France, June **2022**
10. Eco-evolutionary dynamics among N interacting strains 'playing' co-colonization games, ICTP-SAIFR, Sao Paolo, Brazil Complex Systems and Statistical Mechanics seminar, January **2021**
9. Understanding microbial competition with mathematical models. On Models and Modelling in Biology, INSA, Toulouse, France June **2019**
8. How mathematics can contribute to control antibiotic resistance: linking infection ecology with personalized treatment based on host immunity, Centre for Infection and Immunity, Institut Pasteur in Lille, France, February **2019**
7. New model formalisms for inferring phenotypic heterogeneity in bacteria - Viral Infections from an Evolutionary Perspective Workshop, Frankfurt Institute for Advanced Studies, Germany 6-7 December **2018**
6. Microbial interactions, dynamics and interventions: from data to processes with mathematical models, University of Michigan, Ann Arbor, USA, (Systems Biology Center at Michigan Medical School), October **2017**
5. Gjini E. Eco-evolutionary dynamics in co-colonization systems with multiple strains, Encontro Nacional da Sociedade de Matematica, Tomar, July 2022, Portugal **Talk**
4. Gjini E. Towards a mathematical understanding of colonization resistance, ISEMPH, July 2022, Lisbon **Talk**
3. Gjini E. and Madec S. A critical transition in N-strain co-colonization dynamics, eSMB 2020 Virtual Meeting, International, **Talk**
2. Gjini E, and Madec S. Coexistence through co-colonization: how the structure of multi-strain interactions leads to fast and slow epidemiological dynamics in diverse microbial systems MMEE 2019, July 2019, Lyon, France **Talk**
1. Gjini E. Inferring phenotypic heterogeneity in bacterial populations from time-kill in vitro dynamics under antibiotics. Challenges and new concepts in antibiotics research (AMR-2018) March 19-21, 2018, Institut Pasteur, Paris, France **Poster**

Outreach activities

- IST Open Day (May 2023) - Mathematical Models for Biomedicine activity
- Scientific speed dating - IGC Open Day (November 2017) with university students
- European Researchers' Night, Sept. 2017 - Simulador de Doencas - Ciência Viva, Lisbon
- NOS-ALIVE-IGC stand, July 2017 - math model activities with Joana Teixeira
- Educational course: Inspirar Ciência, IGC, September 2015: Exploring applications of mathematics in biology, with mathematics teachers from Portuguese high-schools

Media attention on my work:

- Media attention on (Madec & Gjini, 2020): Altmetric (top 5%), DICYT, ScienMag
- Media coverage of my article in Plos Computational Biology (2016):
  Article on national Portuguese newspaper Publico, April 2016
  - ScienceDaily, NewsMedical, DiarioDaSaude,
  - Video interview of co-author Patricia Brito on Portuguese TV Channel. RTP,
  - Radio interview of Erida Gjini and co-author on antibiotic resistance. Antena1

Languages

Albanian, English, Italian, Portuguese, French (Dutch and Spanish, basic)

Other interests

Photography, literature, translation, tango