

Curriculum Vitae – Gabriele Sbaiz

Università Degli Studi di Trieste
Dipartimento di Scienze Economiche, Aziendali, Matematiche e Statistiche
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PERSONAL INFORMATION

Date and place of birth: 19th September 1994 – Latisana (UD), Italy

CURRENT POSITION (from 1st June 2022)

Università Degli Studi di Trieste (Italy)

Post-Doc Researcher at the Department of Economics, Business, Mathematics and Statistics

Project Title: *“Sustainable investment strategies for portfolio optimization in extreme market conditions”*

- From 1st June 2022 to 31st May 2023: financed by Friuli Venezia Giulia Region and in collaboration with Generali Italia
- From 1st June 2023 to 31st May 2024: financed by Fondazione “Franca e Diego de Castro”
- From 1st June 2024 to 31st May 2026: financed by Friuli Venezia Giulia Regional program FSE+2021/2027

Università Degli Studi di Trieste (Italy)

Cultore della Materia in “Matematica Generale” at the Department of Economics, Business, Mathematics and Statistics (from February 2023)

Università Degli Studi di Trieste (Italy)

Post-Doc Delegate at the Department of Economics, Business, Mathematics and Statistics (from November 2022)

WORK EXPERIENCES

2024

Czech Academy of Sciences (Czech Republic)

Invited by the Dean for a visiting period (8th December – 15th December)

University of Granda (Spain)

Visiting period (7th July – 22nd July) at the Applied Mathematics Department with the project *“The study of Cucker-Smale type models in financial markets”*

University of Granda (Spain)

Visiting period (5th May – 20th May) at the Applied Mathematics Department with the project *“The study of Cucker-Smale type models in financial markets”*

- 2018 – 2021** **Università Degli Studi di Trieste (Italy) & Université Claude Bernard - Lyon 1 (France)**
PhD Candidate in “Earth Science, Fluid-Dynamics and Mathematics. Interactions and Methods” & in “InfoMaths”
Title of the project: *“Some stability and instability issues in the dynamics of highly rotating fluids”*
Supervisor: DEL SANTO Daniele (Università Degli Studi di Trieste, Italy)
Co-supervisor: FANELLI Francesco (Université Claude Bernard – Lyon 1, France)
- 2019 – 2020** **Université Claude Bernard - Lyon 1 (France)**
Visiting period (March 2019 – March 2020) at “Institut Camille Jordan” (Lyon) with the project *“Some stability and instability issues in the dynamics of highly rotating fluids”*
- 2019** **Institut Henri Poincaré (Paris, France)**
Visiting period (16th September-25th October) at “Institut Henri Poincaré” (Paris) with the project *“The mathematics of climate and the environment”*

EDUCATION

- Università Degli Studi di Trieste (Italy) & Université Claude Bernard - Lyon 1 (France)**
Double PhD title *cum laude* in “Earth Science, Fluid-Dynamics and Mathematics. Interactions and Methods” & in “InfoMaths”
Date of the defence: 29/03/2022
Title of the thesis: *“Some stability and instability issues in the dynamics of highly rotating fluids”*

Supervisor: DEL SANTO Daniele (Università Degli Studi di Trieste, Italy)
Co-supervisor: FANELLI Francesco (Université Claude Bernard – Lyon 1, France)
- Università Degli Studi di Trieste (Italy) – Dipartimento di Matematica e Geoscienze**
LM-40 Laurea Magistrale (Master Degree)
Date: 25/10/2018
Title of the thesis: *“On the existence of infinite weak solutions for the Euler equations”*
Mark: *110/110 cum laude*
Supervisor: DEL SANTO Daniele
Co-supervisor: CUCCAGNA Scipio
- Università Degli Studi di Trieste (Italy) – Dipartimento di Matematica e Geoscienze**
L-35 Laurea Triennale (Bachelor Degree)
Date: 22/09/2016
Title of the thesis: *“Perfect fluids – The Euler model”*
Mark: *110/110 cum laude*
Supervisor: DEL SANTO Daniele

PUBLICATIONS

- 2025** - I. L. Aprea, **G. Sbaiz**: “A neural network-particle swarm solver for sustainable portfolio optimization problems”. *Decisions in Economics and Finance*.
- G. Bosi, R. Daris, **G. Sbaiz**: “Ad hoc continuity of continuously representable interval orders”. *Economic Theory Bulletin*.
- G. Bosi, **G. Sbaiz**: “Upper semicontinuous utilities for all upper semicontinuous total preorders”. *Mathematical Social Sciences*, **134**, 31-41.
- G. Bosi, **G. Sbaiz**, M. Zuanon: “Net-compact Hausdorff topologies and continuous multi-utility representations for closed preorders”. *Axioms*, **14**, n. 3, 188.
- **G. Sbaiz**: “A dive into the asymptotic analysis theory: a short review from fluid mechanics to financial markets”. *Acta Mathematicae Applicatae Sinica English Series*, **41**, 152–161.
- 2024** - G. Bosi, R. Daris, **G. Sbaiz**: “New characterizations of completely useful topologies in mathematical utility theory”. *Rendiconti dell'Istituto di Matematica dell'Università di Trieste: An International Journal of Mathematics*, **56**, paper n. 2.
- T. Tonelli, G. Pietropolli, **G. Sbaiz**, L. Manzoni: “Genetic programming for the reconstruction of delay differential equations in Economics”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion* (pp. 2119-2122).
- **G. Sbaiz**, L. Kosloff: “Fast rotation and inviscid limits for the SQG equation with general ill-prepared initial data”. *Nonlinear Differential Equations and Applications*, **31**, paper n. 49.
- M. Kaucic, F. Piccotto, **G. Sbaiz**: “A constrained swarm optimization algorithm for large-scale long-run investments using Sharpe ratio-based performance measures”. *Computational Management Science*, **21**, n. 6.
- 2023** - M. Kaucic, F. Piccotto, P. Rossi, **G. Sbaiz**, G. Valentinuz: “The role of ESG ratings in investment portfolio choices”. In: *Enhancing Sustainability Through Non-Financial Reporting*, IGI Global, 233-261.
- G. Bosi, L. Franzoi, **G. Sbaiz**: “Properties of topologies for the continuous representability of all weakly continuous preorders”. *Mathematics*, **11**, n. 20, 4335.
- **G. Sbaiz**: “Sustainable information into portfolio optimization models”. *Journal of Applied Math*, **1**, n. 1, Paper n. 125
- M. Kaucic, F. Piccotto, **G. Sbaiz**, G. Valentinuz: “Optimal portfolio with sustainable attitudes under cumulative prospect theory”. *Journal of Applied Finance & Banking*, **13**, n. 4, 65-86.
- M. Kaucic, F. Piccotto, **G. Sbaiz**, G. Valentinuz: “A hybrid level-based learning swarm algorithm with mutation operator for solving large-scale cardinality-constrained portfolio optimization problems”. *Information Sciences*, **634**, 321-339.
- D. Del Santo, F. Fanelli, **G. Sbaiz**, A. Wróblewska-Kamińska: “On the influence of gravity in the dynamics of geophysical flows”. *Mathematics in Engineering*, **5**, n. 1, paper n. 8, 33 pp.

- 2022** **G. Sbaiz**: “Fast rotation limit for the 2-D non-homogeneous incompressible Euler equations”. Journal of Mathematical Analysis and Applications, **512**, n. 1, 126140, 41 pp.
- 2021** D. Del Santo, F. Fanelli, **G. Sbaiz**, A. Wróblewska-Kamińska: “A multiscale problem for viscous heat-conducting fluids in fast rotation”. Journal of Nonlinear Science, **31**, n. 1, paper n. 21, 63 pp.

PHD THESIS

- 2022** “Some stability and instability issues in the dynamics of highly rotating fluids”
Discussed *cum laude* on the 29th March 2022, 173 pp.

TALKS

- 02/06/2025**: “Genetic Programming for the Reconstruction of Delay Differential Equations in Economics” at the 8th International Conference on the Dynamics of Information Systems, London (United Kingdom)
- 23/04/2025**: “Multi-Objective Particle Swarm Optimization for Environmental Risk/Benefit Analysis” at EvoStar 2025 (Trieste, Italy)
- 16/04/2025**: “A neural network-particle swarm solver for sustainable portfolio optimization problems” at the XXVI Workshop on Quantitative Finance (Palermo, Italy)
- 11/09/2024**: “A neural network-particle swarm solver for sustainable portfolio optimization problems” at MME 2024 Conference (Ústí nad Labem, Czech Republic)
- 05/09/2024**: “A constrained swarm optimization algorithm for large-scale long-run investments using Sharpe ratio-based performance measures” at AMASES 2024 Conference (Ischia, Italy)
- 02/11/2023**: “A constrained swarm optimization algorithm for large-scale long-run investments using Sharpe ratio-based performance measures” at International Fintech Research Conference (Napoli, Italy)
- 21/09/2023**: “Some stability and instability features for Navier-Stokes-Fourier equations” at MAIn PDEs Conference (Bertinoro, Italy)
- 30/06/2023**: “A bio-inspired solver for sustainable portfolios with volatility control” at 11th General AMaMeF Conference (Bielefeld, Germany)
- 15/06/2023**: “An evolutionary algorithm for portfolio allocation problems with ESG benefits” at MathRisk Conference on Numerical Methods in Finance (Udine, Italy)
- 08/06/2023**: “The role of ESG ratings in investment portfolio decision-making” at 22nd MIC 2023 (Trieste, Italy)
- 28/10/2022**: “A hybrid level-based learning swarm optimizer for portfolio allocation models with ESG rating” at International Fintech Research Conference (Milano, Italy)
- 24/09/2022**: “A hybrid level-based learning swarm algorithm with mutation operator for solving large-scale cardinality-constrained portfolio optimization problems” at AMASES 2022 Conference (Palermo, Italy)
- 08/09/2022**: “A level-based learning swarm optimizer for large-scale portfolio allocation models with ESG merits” at PRIMO Workshop (Trieste, Italy)
- 30/08/2022**: “Interaction of multi-scales for fluids in fast rotation” at Mathematics of geophysical fluid dynamic models of intermediate complexity (Reading, United Kingdom)
- 24/08/2022**: “Fast rotation limit for the 2D density-dependent Euler system” at Mathematical Fluid Mechanics In 2022 (Prague, Czech Republic)

- 24/02/2022:** *"The influence of gravity in the behaviour of geophysical flows"* Webinar at ESFM Presentation Days (Trieste, Italy)
- 23/04/2021:** *"Singular Perturbation Problems for Geophysical Flows"* Webinar at GIM Seminars (Online)
- 19/03/2021:** *"Interaction of multiple scales in geophysical fluid dynamics"* Webinar at CRISIS Kick-off event (Lyon, France)
- 25/02/2021:** *"Multi-scale Analysis in Geophysical Fluid-Dynamics"* Webinar at ESFM Presentation Days (Trieste, Italy)
- 06/10/2020:** *"Singular perturbation and multi-scale problems for fluids in fast rotation"* at Journée d'équipe EDPA (Lyon, France)
- 14/08/2020:** *"MPE Webinar"* at 2020 SIAM Mathematics of Planet Earth (Virtual Meeting)
- 08/06/2020:** *"A multi-scale problem for viscous heat-conducting fluids in fast rotation"* Webinar at Séminaire des Doctorants et Doctorantes (Lyon, France)
- 09/12/2019:** *"Mathematical models for atmospheric flows"* at ESFM Presentation Days (Trieste, Italy)
- 04/05/2018:** *"Algebraic equations: a journey through the history"* at Giornata di Formazione per Docenti di Scuole di ogni Ordine e Grado (Trieste, Italy)

ORGANIZATION OF EVENTS

- 2025** Co-organizer of *"MIC2025"*, 4-7th June (Zadar, Croatia)
- 2024** Co-organizer of *"MIC2024"*, 5-8th June (Trento, Italy)
- 2023** - Co-organizer of *"Workshop in Memory of Ermanno Pitacco"*, 24th November (Trieste, Italy)
- Co-organizer of *"MIC2023"*, 7-10th June (Trieste, Italy)
- 2022** Co-organizer of *"Fluid-Dynamics Day"*, 30th March (Trieste, Italy)
- 2021** Co-organizer of *"Séminaire des Doctorants et Doctorantes 2020-2021"* (Lyon, France)
- 2020** - Co-organizer of *"Séminaire des Doctorants et Doctorantes 2020-2021"* (Lyon, France)
- Co-organizer of *"Mathematics of Planet Earth Webinars: Analysis and Modelling"*, 8th May-24th July (Online)

AWARDS

- 2024** AMASES Award for the best paper presented at the XLVIII AMASES conference - *"A constrained swarm optimization algorithm for large-scale long-run investments using Sharpe ratio-based performance measures"*

GRANTS AND PROJECTS

- CRISIS - *"Critical Regularity, Interfaces, Scale Interactions and Singularities in the dynamics of non-homogeneous fluids"* (February 2021-September 2023), supported by the ANR (Agence Nationale de la Recherche), Project "ANR JCJC 2020" (coordinator: FANELLI Francesco)
- *"Su alcuni problemi di stabilità e instabilità nella dinamica dei fluidi in rotazione rapida"/C2-1288* (January 2020-December 2022), supported by Università Italo-Francese/Université Franco-Italienne in the program "Vinci 2020"

EDITORIAL ACTIVITIES

- Editorial Member for *Far East Journal of Mathematical Sciences* (Pushpa Publishing House - ISSN: 0972-0871)
- Editorial Member for *Far East Journal of Applied Mathematics* (Pushpa Publishing House - ISSN: 0972-0960)
- Section Editor for *Journal of Applied Math* (Academic Publishing)

REVIEWER ACTIVITIES

- Reviewer for *Journal of Mathematical Analysis and Applications* (Elsevier)
- Reviewer for *Computational Economics* (Springer)
- Reviewer for *Digital Finance* (Springer)
- Reviewer for *Computational and Applied Mathematics* (Springer)
- Reviewer for *Pure and Applied Mathematics Journal* (SciencePG)
- Reviewer for *AIMS Mathematics* (AIMS Press)
- Reviewer for *Mathematics* (MDPI)
- Reviewer for *Games* (MDPI)
- Reviewer for *Sustainability* (MDPI)
- Reviewer for *Journal of Risk and Financial Management* (MDPI)
- Reviewer for *AppliedMath* (MDPI)
- Reviewer for *Applied Sciences* (MDPI)
- Reviewer for *Symmetry* (MDPI)

COURSES, EXERCISE SESSIONS AND TUTORING ACTIVITIES

- 2024-2025**
- PhD Course: “*Advanced Topics in Optimization*”, Circular Economy PhD Programme (10h)
 - Course offered to undergraduate students: “*Mathematics*” DEAMS (90h)
 - Support course offered to undergraduate students: *Corso di supporto “Matematica per l’economia e la statistica 1”* DEAMS (15h)
- 2023-2024**
- Course offered to undergraduate students: “*Mathematics*” DEAMS (75h)
Students’ evaluation (average): 8.1
 - Support course offered to undergraduate students: *Corso di supporto “Matematica per l’economia e la statistica 1”* DEAMS (15h)
 - Exercise sessions offered to undergraduate students: “*Matematica Generale*” DEAMS (20h)
- 2022-2023**
- Support course offered to undergraduate students: *Corso di supporto “Matematica per l’economia e la statistica 1”* DEAMS (15h)

- Exercise sessions offered to undergraduate students: *"Matematica Generale"* DEAMS (20h)
- Exercise sessions offered to undergraduate students: *"Calcolo delle Probabilità"* AI and Data Analytics degree (20h)
- Exercise sessions offered to undergraduate students: *"Analisi Matematica 2"* AI and Data Analytics degree (20h)

- 2021-2022**
- Exercise sessions offered to undergraduate students: *"Matematica Generale"* DEAMS (20h)
 - Complementary tutoring and teaching activities offered to undergraduate students: *"Metodi e Modelli Matematici per l'Intelligenza Artificiale"* AI and Data Analytics degree (50h)
- 2019-2020**
- Complementary tutoring and teaching activities offered to undergraduate students: *"Istituzioni di Matematica"* STAN degree (50h)

PARTICIPATION IN CONFERENCES, SCHOOLS AND WORKSHOPS

- 2025**
- Conference: *"8th International Conference on the Dynamics of Information Systems"*, 1-5th June London (United Kingdom)
 - Conference: *"EvoStar 2025"*, 23-25th April (Trieste, Italy)
 - Conference: *"XXVI Workshop on Quantitative Finance (QFW2025)"*, 15-17th April (Palermo, Italy)
 - Conference: *"International Fintech Research Conference"*, 30th-31st January (Perugia, Italy)
- 2024**
- Workshop: *"ESG e Finanza: Oltre il Greenwashing... Verso un Impatto Realmente Sostenibile"*, 14th November (Online)
 - Workshop: *"DEAMS Research Retreat"*, 18-20th October (Spilimbergo, Italy)
 - Conference: *"42nd International Conference on Mathematical Methods in Economics"*, 11-13th September (Ústí nad Labem, Czech Republic)
 - Conference: *"AMASES 2024"*, 5-7th September (Ischia, Italy)
 - Conference: *"2nd Conference on Sustainable Banking & Finance"*, 21st June (Napoli, Italy)
 - Workshop: *"Bridging Sustainability and Artificial Intelligence"*, 16th February (Online)
- 2023**
- Workshop: *"Workshop in Memory of Ermanno Pitacco"*, 24th November (Trieste, Italy)
 - Conference: *"International Fintech Research Conference"*, 2nd-3rd November (Napoli, Italy)
 - Conference: *"6th Asset Pricing Conference by LTI@UniTO"*, 10th October (Online)
 - Conference: *"MAIn PDEs"*, 18th-22nd September (Bertinoro, Italy)
 - Conference: *"11th General AMaMeF Conference"*, 26-30th June (Bielefeld, Germany)
 - Conference: *"MathRisk Conference on Numerical Methods in Finance"*, 14-16th June (Udine, Italy)
 - Conference: *"22nd MIC 2023"*, 7-10th June (Trieste, Italy)
 - Conference: *"ContOpt Pisa 2023"*, 8-10th May (Online)
- 2022**
- Workshop: *"Metodi Quantitativi per il Fundraising"*, 4th November (Online)
 - Conference: *"The 19th Chinese Finance Annual Meeting"*, 29-30th October (Online)
 - Conference: *"International Fintech Research Conference"*, 27-28th October (Milano, Italy)
 - Workshop: *"RISK2022"*, 20-21st October (Online)
 - Conference: *"AMASES 2022"*, 22nd-24th September (Palermo, Italy)
 - Workshop: *"2nd PRIMO"*, 6-8th September (Trieste, Italy)

- Workshop: *“Mathematics of geophysical fluid dynamic models of intermediate complexity”*, 30th August-1st September (Reading, United Kingdom)
- Conference: *“Mathematical Fluid Mechanics In 2022”*, 22nd-26th August (Prague, Czech Republic)
- Workshop: *“TURBIN – Turbulence and Intermittency”*, 28th February (Lyon, France)

- 2021**
- Workshop: *“TURB1D 2021”*, 2nd-3rd November (Online)
 - INdAM Workshop: *“Qualitative properties of dispersive PDEs”*, 2nd-4th September (Online)
 - Workshop: *“One World Meeting of Young Mathematicians in Fluid Dynamics”*, 17-18th June (Online)
 - INdAM Workshop: *“Nonlinear Phenomena: between ODEs and PDEs”*, 7-9th June (Online)
 - Spring School: *“Huitième école EGRIN”*, 25-28th May (Online)
 - Workshop: *“CRISIS” kick off-event*, 19th March-2nd April (Online)
 - Conference: *“Journées Jeunes EDPistes 2021”*, 24-26th March (Online)

- 2020**
- Conference: *“TURB1D 2020”*, 23rd-27th November (Online)
 - Winter School: *“Turbulence in Fluids and PDEs”*, 27th-31st January (Lausanne, Switzerland)

- 2019**
- IHP Trimester: *“The Mathematics of Climate and the Environment”*, 16th September-25th October (Paris, France)
 - INdAM Workshop: *“Anomalies in PDEs”*, 9-13th September (Roma, Italy)
 - Workshop: *“Alessio Figalli, Fields Medallist 2018”*, 14-17th January (Pisa, Italy)

- 2018**
- Winter School: *“Fluid-Dynamics, Dispersive Equations and Quantum Fluids”*, 17th-21st December (Bressanone, Italy)

DISSEMINATION ACTIVITIES

- 2024**
- Poster *“Sostenibilità e analisi dei rischi estremi per migliori investimenti responsabili”* under the project *“Ragioni Comuni”* at Trieste Next Event, 28th September (Trieste, Italy)
 - Co-author of *“Sustainable investing: the price of future!”* at S.T.R.E.E.T.S., 27th September (Napoli, Italy)
 - *“Matematici al lavoro”* organized by the MIGe Department, 19th April (Trieste, Italy)
- 2023**
- “Intelligenza artificiale ed ESG: sfide per un futuro di investimenti sostenibili”* at Street Science of Maker Faire Trieste, 2nd September (Italy)
- 2021**
- “PhD Top Stories”* at UniTs

SUPERVISION OF THESIS

2023 - *“Un algoritmo multi-obiettivo per la risoluzione di problemi di ottimizzazione di portafoglio con obiettivi sostenibili e di diversificazione”* (Master student: Andrea Ambrosi), Co-supervision with Massimiliano Kaucic

- *“Un confronto tra algoritmi di tipo swarm per problemi di grandi dimensioni”* (Bachelor student: Micaela Polo), Co-supervision with Massimiliano Kaucic

2022 - *“Strategie di investimento con vincoli di sostenibilità”* (Bachelor student: Francesca Galuppo), Co-supervision with Massimiliano Kaucic

- *“L’operatore Proximal: alcune applicazioni in ambito finanziario”* (Bachelor student: Alessio Visintini), Co-supervision with Massimiliano Kaucic

MEMBERSHIP

- Member of Associazione per la Matematica Applicata alle Scienze Economiche e Sociali (AMASES)
- Member of Istituto Nazionale di Alta Matematica “Francesco Severi” (INdAM)
- Member of Association for Computing Machinery

LANGUAGES

Italian – Native speaker

English – Fluent

French – Intermediate level

Trieste, 15/07/2025

FIRMATO

“Autorizzo il trattamento dei dati personali nelle modalità previste dal Regolamento UE 2016/679”.