Kerlyns Martínez

Postdoctorant at CMM, Universidad de Chile

Ph.D. in Mathematics

Personal Information

Place and Date of Birth:	Los Teques, Venezuela | January 28th, 1993.
Address:	Amunátegui, 2064B, Recreo. Viña del Mar, Chile.
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Research Interest

Mathematical Modelling, Probability and Statistics, Stochastic Processes and Stochastic Differential Equations, Numerical Probability, Stochastic Optimal Control Problems, Lagrangian Turbulent Flow Models and Calibration of Model Parameters, Kinetic Models.

Education

July 2019 / March 2015 — Doctorate in Mathematics
Universidad de Valparaíso, Chile
Thesis Title: Penalized stochastic optimal control problems for singular McKean-Vlasov Dynamics and turbulent kinetic energy: modeling, calibration and simulation.

2009-2014 — Bachelor degree in Mathematics
Universidad Central de Venezuela
Thesis Title: Kac-Rice Formulas in Differential Manifolds.

Awards and Scholarships

April 2021 - April 2023 — ANID FONDECYT Postdoctoral Grant.

November 2018 - February 2019 — CONICYT Grant: Complementary benefits for internship at National Research University HSE, Moscow

2016 — CONICYT Scholarship Doctorate

2015 — PhD Scholarship in Mathematics, Universidad de Valparaiso

2014 — Special Grade Award. 1st place in the promotion. Faculty of Sciences, Universidad Central de Venezuela

Publications and Communications

2021 — **Published in Applied Mathematical Modelling**, Bossy Mireille, Henry Christophe, Maftei Radu, Martínez Kerlyns, Shekarforush Seyedafshin
CFD simulations of particle-laden flows: a new spatial decomposition method for accurate, mesh-independent agglomeration predictions. Vol. 90, pp. 582-614. doi.org/10.1016/j.apm.2020.08.064

2021 — **Published in Bernoulli**, Bossy Mireille, Jabir Jean-François, Martínez Kerlyns
On the weak convergence rate of an exponential Euler scheme for SDEs governed by coefficients with superlinear growth. Vol. 27 (1) pp. 312-347. doi.org/10.3150/20-BEJ1241

April 2021 | **Article to be submitted in IJMF**, Bossy Mireille, Henry Christophe, Martínez Kerlyns
Particle agglomeration in flows: fast D2SD algorithm for CFD simulations.

January 2021 | **Article submitted to JCOMP**, Bossy Mireille, Jabir Jean-François, Martínez Kerlyns
Instantaneous turbulent kinetic energy modelling based on Lagrangian stochastic approach in CFD and its application to wind energy modelling.

October 2020 | **Article in preparation**, Jabir Jean-François, Martínez Kerlyns
Weakly constrained problems for controlled McKean-Vlasov dynamics.

December 2020 | **Accepted short communication on ERCIM journal**, Henry Christophe, Martínez Kerlyns, Bossy Mireille, Guillard Hervé, Rutard Nicolas and Murrone Angelo
Social Distancing: The Sensitivity of Numerical Simulations. Special issue: *Epidemic Modelling and Simulation*.

January 2020 | **Accepted Poster**, Congrès Français sur les Aérosols, *ASFERA*
Poster title: Particle agglomeration in a flow: A Partitioning Algorithm for Well-Mixed Condition (PAWMC) in CFD simulations

June 2018 | **Accepted Abstract Conference (link)**, *University of Cergy-Pontoise*
Calibration on Lagrangian Turbulent Flow Models.

December 2016 | **Accepted Poster**, VII Jornada de investigación DIUV
Poster title: Optimal Control Problems for Weakly Constrained Diffusion Process.

Oral Presentations

March 2021 | Seminario de Probabilidades de Chile
Title: On the weak convergence rate of an exponential Euler scheme for SDEs governed by coefficients with superlinear growth.

November 2020 | Séminaire de l'équipe Calisto, INRIA
Title: Physical-based probabilistic models for the instantaneous turbulent kinetic energy: modelling, calibration and validation.

August 2020 | Bernoulli-IMS One World Symposium 2020
Title: On the weak convergence rate of an exponential Euler scheme for SDEs governed by coefficients with superlinear growth.

December 2018 | LSA winter meeting, *National Research University High School of Economics*
Title: Turbulent Kinetic Energy modeling, calibration and numerical approximation by means of Lagrangian Turbulent Flow models.

July 2018 | CIMFAV Seminar, *Universidad de Valparaíso*
Título: Turbulent Kinetic Energy modeling and Calibration on Lagrangian turbulent Flow Models.

June 2018 | Conference on non-stationarity, *University of Cergy-Pontoise*
Title: Calibration on Lagrangian Turbulent Flow Models.

November 2017 | REDES Workshop , *Universidad de Valparaíso*
Title: Calibration on Lagrangian Turbulent Flow Models.

February 2017 | Doctoral seminar of TOSCA team, *INRIA*
Title: Stochastic Optimal Control Problems with distribution constraint.

August 2016 | Econometrics and Financial Statistics Workshop, *PUCV*
Title: An Overview of Stochastic Optimal Control Problems in Finance.

June 2014 | Jornadas de Investigación y Extensión
Universidad Central de Venezuela
Title: Fórmula de Kac-Rice en Variedades Diferenciales.

Congress and Projects

April 2021 - April 2023 | ANID Fondecyt Postdoctoral project
CMM, Universidad de Chile.
Project title: Stochastic models of mean-field interacting systems in mathematical physics and machine learning: theoretical problems and applications.

September 2020 | Online Opening EcoDep Conference
Ecology dependence project (link).

June. 2020 - August 2020 | Mission INRIA Covid-19
Sophia Antipolis, Francia.
Project title: Spreading Factors: Sensitivity of droplet dispersion to emission properties and ambient air.

Oct. 2019 - August 2020 | Postdoctorant, INRIA Team CALISTO
Sophia Antipolis, Francia.
Project title: Approches stochastiques pour la simulation de l'agrégation de particules dans des flux complexes: analyses mathématiques et numériques.

2016-2018 | CONICYT, REDES Project 150038
Valparaíso, Chile.
Project title: Stochastic methods for parametric and nonparametric Bayesian calibration models applied to fluid dynamics.

June 2016 | SVAN 2016
Instituto de Matemáticas Puras y Aplicadas, IMPA
Rio de Janeiro, Brasil.
Minicurses on: Stochastic Optimal Control, Stochastic Variational Inequalities.

March 2016 | Workshop: Analysis and Applications of Stochastic Systems.
Instituto de Matemáticas Puras y Aplicadas, IMPA
Rio de Janeiro, Brasil.

January 2016 | 2do Mini-summer school in Probability and Stochastic Processes.
Centro de Modelamiento Matemático, CMM
Santiago de Chile, Chile.

2015-2016 | Research FONDECYT Initiation Project 11130705.
Valparaíso, Chile.
Project Title: McKean-Vlasov type stochastic models with singular interactions and applications.

September 2014 | 3rd Summer School in Mathematics of Valparaiso.
PUCV, UTFSM, UV.
Valparaíso, Chile.
Minicourses: Fractional Sobolev Spaces, Non-parametric estimation, Elliptic Curves.

Internships and Doctoral Visits

November-January 2018
February-March 2019

Internship
Laboratory of Stochastic Analysis and its Applications
National Research University High School of Economics, Moscow.

January-February 2019

Research Visit
Institut National de Recherche en Informatique et en Automatique
Sophia Antipolis, Francia.

January-February 2017
August-October 2017
February 2018

Research Visit
INRIA / Laboratory of Fluids Dynamics, ENSAM
Paris / Sophia Antipolis, Francia.
Collaboration work with Bossy Mireille (INRIA, Sophia Antipolis), Cinnella Paola (ENSAM, Paris) and Jean-François Jabir (HSE, Moscow)
Project title: Calibration on Lagrangian turbulent flow models and quantification of uncertainty on wind energy

Work experience

October 2019 -
February 2021

Postdoctorant researcher
INRIA, Sophia-Antipolis.
Approches stochastiques pour la simulation de l'agrégation de particules dans des flux complexes: analyses mathématiques et numériques.

2015 - 2019

Professor with conventional dedication
Pontificia Universidad Católica de Valparaíso, Instituto de Matemáticas
Courses for different engineering schools and mathematics: Algebra, Calculus, Differential Equations, Introduction to Mathematics, Numerical methods.

July 2014 -
February 2015

Professor Instructor, conventional dedication (link)
Universidad Central de Venezuela, Escuela de Matemáticas
Course taught: Calculus II for mathematicians.

July 2011 -
June 2014 -

Teacher assistant (practice courses)
Universidad Central de Venezuela, Facultad de Ciencias
Course taught: Calculus for different schools in the Faculty of Science.

Languages

Spanish: Mothertongue
English: Fluent
French: Beginner

Computer Skills

Scientific languages: Maple, Mathematica, Matlab, R
Programming: SQL, C/C++, Python, LaTeX