

Shahine Bouabid

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Education

PhD in Statistics — University of Oxford, Oxford, UK	2020 – 2024
MSc in Machine Learning (MVA) — ENS Paris-Saclay, Paris, France	2018 – 2019
MSc in Applied Mathematics — École Centrale Paris, Paris, France	2015 – 2019
Classes préparatoires — Lycée Saint-Louis, Paris, France	2013 – 2015

Research experiences

Postdoctoral Associate — MIT EAPS, Cambridge, Massachusetts	2024 – now
Visiting Researcher — CISPA, Saabrücken, Germany	2023
Visiting Researcher — University of Valencia, Valencia, Spain	2023

Grants and Fellowships

Helmholtz Visiting Researcher Grant	2023
European Comission Marie-Skłodowska Curie Fellowship	2020

Publications

In review

C. Womack, **S. Bouabid**, X. Gao, J. Morris, A. Schlosser, G. Flierl, N. Selin, Assessing spatially explicit sensitivities to scenario uncertainty through climate emulation

C. Womack, **S. Bouabid**, A. Sokolov, P. Salunke, G. Flierl, S. Eastham, N. Selin, Optimal scenario design for climate emulation

Published / In press

S. Bouabid, C. Womack, N. Selin, R. Ferrari, Evidence that end-of-century emulation errors under overshoot remain largely within internal variability in an Earth system model, *Environmental Research Letters*, 2026

S. Bouabid, A. Souza, R. Ferrari, Score-based generative emulation of impact-relevant Earth system model outputs, *Journal of Advances in Modeling Earth Systems*, 2026

C. Womack, G. Flierl, **S. Bouabid**, A. Souza, P. Giani, S. Eastham, N. Selin , A theoretical framework to understand sources of error in Earth System Model emulation, *Earth System Dynamics*, 2026

N. Mankovich, **S. Bouabid**, P. Nowack, D. Bassotto, G. Camps-Valls, Analyzing Climate Scenarios with Dynamic Mode Decomposition with Control, *Environmental Data Science*, 2025

S. Bouabid, D. Sejdinovic, D. Watson-Parris, FaIRGP : A Bayesian Energy Balance Model for Surface Temperature Emulation, *Journal of Advances in Modeling Earth Systems*, 2024

A. Singh, S. L. Chau, **S. Bouabid**, K. Muandet, Domain Generalisation via Imprecise Learning, *International Conference on Machine Learning*, 2024 (3% top submissions)

S. Bouabid, D. Watson-Parris, S. Stefanovic, A. Nenes, D. Sejdinovic, Aerosol optical depth disaggregation : toward global aerosol vertical profiles, *Environmental Data Science*, 2024

S. Bouabid*, J. Fawkes*, D. Sejdinovic, Returning the Favour : When Regression Benefits from Probabilistic Causal Knowledge, *International Conference on Machine Learning*, 2023 (2.4% top submissions)

D. Watson-Parris, Y. Rao, D. Olivié, Ø. Seland, P. Nowack, G. Camps-Valls, P. Stier, **S. Bouabid**,..., ClimateBench v1. 0: A Benchmark for Data-Driven Climate Projections, *Journal of Advances in Modelling Earth Systems*, 2022

S. L. Chau*, **S. Bouabid***, D. Sejdinovic, Deconditional Downscaling with Gaussian processes, *Advances in Neural Information Processing Systems*, 2021

Contributed presentations

2026

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| EGU General Assembly Meeting
Advances in generative climate emulation to support impact assessment | Talk |
| AeroAstro Earth Observation Symposium
Can climate emulators project future lived conditions? | Talk |
| MIT Center for Computational Science & Engineering
Advances in generative climate emulation to support impact assessment | Talk |
| University of Oxford
Advances in generative climate emulation to support impact assessment | Invited Talk |

2025

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| University of Chicago
Score-based generative emulation of impact-relevant Earth system model outputs | Invited Talk |
| MIT Center for Ocean Engineering
Score-based generative emulation of impact-relevant Earth system model outputs | Talk |
| MIT Center for Sustainability Science & Strategy
Score-based generative emulation of impact-relevant Earth system model outputs | Talk |
| Climate Week NYC Innovation Showcase
Fast climate projections to inform climate adaptation and mitigation efforts | Booth Demo |
| Gordon Research Conference on Machine Learning for Actionable Climate Science
Emulation of impact-relevant climate model outputs | Poster |

2024

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| MIT Center for Sustainability Science & Strategy
Developing emulators with Gaussian processes | Talk |
| ICLR Workshop on Tackling Climate Change with Machine Learning
Calibrating Earth System Models with Bayesian Optimal Experimental Design | Poster |
| EGU General Assembly Meeting
Analyzing Climate Scenarios Using Dynamic Mode Decomposition with Control | Poster |

2023

- EGU General Assembly Meeting** Talk
Probabilistic climate emulation with physics-constrained Gaussian processes
- International Conference on Machine Learning** Talk
Returning the Favour : When Regression Benefits from Probabilistic Causal Knowledge
- Helmholtz Center for Information Security** Invited Talk
Opportunities for Data-driven Modelling in Climate Science

2022

- University College London** Invited Talk
Deconditional Downscaling with Gaussian processes
- NeurIPS Workshop on Tackling Climate Change with Machine Learning** Poster
Bayesian inference for aerosol vertical profiles
- iMiracli Summer School** Talk
A simple Bayesian model to reconstruct aerosol vertical profiles

2021

- Neural Information Processing Systems** Poster
Deconditional Downscaling with Gaussian processes
- ICML Workshop on Tackling Climate Change with Machine Learning** Poster
Reconstructing aerosol vertical profiles with aggregate output learning

2020

- NeurIPS Workshop on Tackling Climate Change with Machine Learning** Poster
Predicting Landsat reflectance with deep generative fusion

Diversity & Outreach Efforts

- Nechfate** 2022–present
Co-founded Nechfate, the first online media that popularizes climate change, its impacts, and adaptation solutions in Morocco. Through short, illustrated, and data-driven articles, our goal is to inform readers about Morocco's challenges in terms of climate change, water & agriculture, and governance & society.
- EAPS Sack Lunch Seminar** 2025–present
Organised regular seminar fostering conversations in small-group settings. The seminar provides an informal venue for research discussions and is often used by students as a platform for pre-defense practice.
- Oxford Stats Green Team** 2022–2023
Assisted in developing guidelines for department members to assess and reduce their carbon footprints. Raised awareness about aviation-related carbon emissions, encouraging environmentally responsible actions.
- European Researchers Night** 2022
Organised an outreach session at the Stockholm Bolin Center to introduce high school students to the mechanisms of aerosol-cloud interactions and their significance for climate.
- OxCSML Equality, Diversity & Inclusion Committee** 2020–2022
Organised the department's first student-led EDI group, which aims to develop and sustain a diverse, inclusive, and equitable academic environment and community. Activities included organising student-only seminars, arranging accessible social events and setting up a safe feedback system for students.

Academic Service

Peer reviewer for *Journal of Advances in Modeling Earth Systems*, *Neural Information Processing Systems*, *Geophysical Research Letters*, *Geoscientific Model Development*, *Earth System Dynamics*, *Journal of Geophysical Research*, *Workshop on Tackling Climate Change with Machine Learning*, *Water Resources Research*

Teaching

Undergraduate Research Supervision	2026
Supervision of an undergraduate student on generative modeling with consistency models	
Co-supervision of Master Research Project	2023–2024
Supervision of a Master’s student on Bayesian inference for climate sensitivity	
Teaching Assistant: Applied Statistics, Computational Statistics, Applied Probability	2022
Tutor: Part A Statistics	2021–2022
Oxford StatML Center for Doctoral Training	2021
Organised an introductory workshop on automatic differentiation with PyTorch	

Professional experiences

Research Intern — Met Office, Exeter, UK	2023
Research Intern — Cervest, London, UK	2020
Research Intern — Deepomatic, Paris, France	2019
Data Science Intern — Jumia PTC, Porto, Portugal	2018

Computer and Language skills

Technical Skills

Python, Julia, Unix — Fully Proficient
PyTorch, JAX, xarray — Fully Proficient
Java, R, JS — Working Knowledge

Language

French, Arabic — Native Language
English — Fully Proficient
Spanish — Working Knowledge