

# Vadim BERTRAND

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France



2<sup>nd</sup> year PhD student in Oceanography – Master's Degree in Statistics – Software Engineer

## EDUCATION

- 2024- **PhD** | Institut des Géosciences de l'Environnement – Team **MEOM**  
*Stochastic Modelling of Drifting Object Trajectories at the Ocean Surface using Machine Learning*  
Supervised by Julien Le Sommer (CNRS Researcher), Emmanuel Cosme (UGA Full Professor) and Adeline Leclercq Samson (UGA Full Professor)  
→ Implementing the Python package [pastax](#)
- 2023 **Master's Degree in Statistics and Data Science** | Université Grenoble Alpes – IM<sup>2</sup>AG  
*Graduated with High Honors*  
Bayesian statistics, Computational statistics, Spatial statistics, Operations research and optimization, Non-parametric and functional estimation, Supervised and unsupervised learning
- 2014 **Engineering Degree** | Grenoble INP – Phelma / Ensimag  
Signal processing, Algorithms and programming, Graph theory, Information theory

## ACADEMIC AND PROFESSIONAL EXPERIENCE

- 2024-2025 **Summer School** | [Ocean Training Course 2025](#) – Organized by the European Space Agency  
*Advanced Training Course on Ocean Synergy Remote Sensing* focusing on the joint use of different satellite instruments to observe oceanic and atmospheric processes  
Shore-based component of 14 training sessions on different Earth Observation satellite measurements  
Ship-based component of 6 weeks from Tromsø (Norway) to Nice (France) aboard the [Statsraad Lehmkuhl](#)  
→ Designed and assembled low-cost surface drifters to be deployed during the campaign, more details [here](#)  
→ Organized a drifter position prediction challenge taking place during the shipboard training, see [here](#)
- 2023 **Research Engineer** | Institut des Géosciences de l'Environnement – Team **MEOM**  
*Variational cyclogeostrophic inversion for estimating ocean surface currents*  
Supervised by Emmanuel Cosme (UGA Full Professor) and Julien Le Sommer (CNRS Researcher)  
→ Implemented the Python package [jaxparrow](#), leveraging JAX. [10.5281/zenodo.14871648](#)
- 2023 **Research Internship** | TIMC – Team Models and Algorithms for Genomics  
*Exploration of joint deconvolution algorithms for omic data* ([report](#), [poster](#))  
Supervised by Magali Richard (CNRS Researcher)
- 2022-2023 **Mentored Master's Project** | Université Grenoble Alpes – IM<sup>2</sup>AG  
*Effect of anthropogenic noise on narwhals behavior* (as part of [this larger study](#))  
Supervised by Adeline Leclercq Samson (UGA Full Professor)
- 2022 **Research Internship** | Laboratoire Jean Kuntzmann – Team Données, Apprentissage et Optimisation  
*Deep generative learning for next-generation drugs* ([report](#))  
Supervised by Sergei Grudinin (CNRS Researcher)
- 2016-2021 **Software Engineer** | Inria / GIPSA-lab – Team Dynamics and Control of Networks  
Supervised by Carlos Canudas-de-Wit (CNRS Researcher)  
→ Developed the web-application [GTL-VILLE](#), collecting, estimating and predicting road traffic indicators in real time in the Grenoble Metropolis ([subsequent publication](#))

## TEACHING

- 2024      **Computing and Data Analysis Project (Supervision of 2 students)** | Université Grenoble Alpes - Master in Earth, planetary and environmental sciences
- 2024      **Statistics (Practical Session)** | Université Grenoble Alpes - Bachelor in Biochemistry

## INTERNSHIP SUPERVISION

- 2024      **Léo Boux de Casson (Bachelor, École Normale Supérieure de Lyon)**, with Julien Le Sommer  
*Eulerian comparison of lagrangian drifter velocities and reconstructed sea surface currents within the SWOT swath in the Mediterranean sea*

## SCIENTIFIC ACTIVITIES

- 2025      **Journal Article** *in preparation* | V. Bertrand, J. Le Sommer, M. Ballarotta, V. Zaia De Almeida, A. Samson, E. Cosme, *Robust inversion of the cyclogeostrophic balance equation: Application to global Sea Surface Height maps*.
- 2025      **Hackathon** | Attendee in the [JAXATHON](#) organized at IGE, Grenoble, France.  
Gave an informal presentation of the JAX ecosystem. [PDF](#)
- 2024      **Poster Presentation** | *Stochastic and differentiable simulators of drifting objects trajectories*, EDITO WP2 Workshop, Grenoble, France. [PDF](#)
- 2024      **Oral Presentation** | *Cyclogeostrophic inversion for estimating Sea Surface Currents from SWOT altimeter data*, 30YPRA-OSTST, Montpellier, France. [PDF](#)
- 2024      **Poster Presentation** | *Cyclogeostrophic inversion for estimating Sea Surface Currents*, EGU, Vienna, Austria. [10.5194/egusphere-egu24-17489](https://doi.org/10.5194/egusphere-egu24-17489)
- 2023      **Poster Presentation** | *Scoring and ranking strategies to benchmark cell type deconvolution pipelines*, JOBIM and ISMB, Nice and Lyon, France. [PDF](#)
- 2018      **Journal Article** | G. Casadei, V. Bertrand, B. Gouin, C. Canudas-de-Wit, *Aggregation and travel time calculation over large scale traffic networks: An empiric study on the Grenoble City*. Transportation Research Part C: Emerging Technologies, 2018. [10.1016/j.trc.2018.07.033](https://doi.org/10.1016/j.trc.2018.07.033)

## OPEN SOURCE CONTRIBUTIONS

**Personal Projects**, developer and maintainer of:

[pastax](#) *Parameterizable Auto-differentiable Simulators of ocean Trajectories in jAX*  
[jaxparrow](#) *A package for computing the inversion of the cyclogeostrophic balance based on a variational formulation approach*. [10.5281/zenodo.14871648](https://doi.org/10.5281/zenodo.14871648)

**Community Projects**, contributor to:

[clouddrift](#) *Accelerates the use of Lagrangian data for atmospheric, oceanic, and climate sciences*  
[quax](#) *Multiple dispatch over abstract array types in JAX*  
[widetrax](#) *Toolbox for manipulating wide-swath altimetry ocean data*

## MISCELLANEOUS

**Living languages**

English: fluent, Spanish: notions

**Programming languages**

Python (JAX, PyTorch, NumPy, Xarray, etc...), Julia, R ; Git ; Shell scripting

**Hobbies**

Rugby (2 years in sports study) and now Touch rugby ([what is this?](#)), Running, Ski touring, Diving