

**Personal information:**

- Argentinean and French citizen
- [ernehorne@gmail.com](mailto:ernehorne@gmail.com)
- [www.ernestohorne.com](http://www.ernestohorne.com)
- born: 05.02.1985

# Ernesto Horne

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**Physics, Research & Development:**

Quantitative analysis; Scientific modelling; Computational simulations; Signal processing; Team management; Machine learning; Remote sensing; Geophysical flows; Physics in sports.

## Work experience

(2022–) **Teraki GmbH**, Berlin, Germany.

*Senior Research and Development*

- Group leader for remote sensing and model-development for Advance Driver-Assistance Systems.

(2021) **École Normale Supérieure de Lyon**, Physics Lab, France.

Collaboration with GFZ German Research Centre for Geosciences.

*Postdoctoral research associate in modelling of boundary layer and aerodynamics of cyclists.*

(2017–2020) **École Polytechnique**, LadHyX, Paris, France

*Postdoctoral research associate in large scale turbulence and geophysical flows*

- Planned, developed, constructed and implemented a novel experimental setup.
- Conducted fundamental research and modelling in geophysical fluid dynamics and numerical simulations.

(2016–2017) **École Centrale**, Lyon, France

*Postdoctoral research associate in modelling of environmental flows*

- Developed a Python post processing library for analysing large dataset.
- Worked and led multiple-discipline collaborations.

(2007–2009) **Universidad de Buenos Aires**, Geology Department, Argentina

*Undergraduate researcher*

- Developed stations for measuring and contrasting observational volcanic seismic data with analytical models.

## IT-Skills

**Programming:** Proficient in Python, Matlab and Version Control Systems.

**Numerics and big data:** Experienced running and analysing large numerical simulations. Experienced with high-performance computing (Fortran, C++) and parallel computing (MPI).

**Data visualization:** Matplotlib, Seaborn and large numerical simulations rendering.

**Machine learning:** algorithm/classification/clustering methods, regression models. SciKitLearn.

**Deep learning and AI:** TensorFlow, Keras, Reinforcement learning.

## Education

(2021) **Data Science bootcamp**, Datascientest, Paris. Duration: 3 months (400h). Certified by Sorbonne.

(2012–2015) **Doctor of Philosophy, Geophysical Fluid Dynamics. École Normale Supérieure de Lyon**, Physics Lab.

"Transport properties of internal gravity waves", *Thesis graded with honours.*

(2005–2012) **Universidad de Buenos Aires**, Physics Department, Argentina

**Masters Thesis, Numerical modelling in fluids.** "Cancellation exponent in rotating flows", graded 10/10.

**Degree studies**, Sc. Physics (equivalent to Bachelor and Masters degree). Majors in fluids dynamics and Earth Sci.

## Awards and scholarships

(10.2018) **Workshop invitation**, EuroTech Postdoc Workshop, TUE, Eindhoven, Netherlands. *All fees considered.*  
(08.2017) **Workshop invitation**, Turbulent Flows in Climate Dynamics, Les Houches, France. *All fees considered.*  
(08.2016) **Young Researchers' Financial support**, ICTAM Congress, Montreal, Canada. *Travel support.*  
(09.2016) **Financial support**, ISSF Symposium, San Diego, USA. *Lodging support.*  
(09.2014) **Financial support**, FDSE Workshop, Cambridge, UK. *Inscription fees support.*  
(2007–2009) **Scholarship**, VOLUME project, European Comision. Univ. Buenos Aires, Argentine. *monthly income.*

## Languages

**Spanish:** Mother tongue.

**English:** Fluent: 5 years residence in California (1989-1994). Working language for 9 years.

**French:** Fluent: 7 years residence in France (2012-2020).

**German:** B1, initial courses and living in Germany. Eager to improve.

## Teaching

Lectures: Environmental hydrodynamics (Master 1 course), École Polytechnique, France (2019).

Lectures: Physics high school level. ECOS high school, Buenos Aires, Argentine (2011-2012).

Supervision: M. H. Hamede, Master 2 research internship, École Polytechnique (2019).

Supervision: D. Micard, Master 2 research internship, ENS de Lyon (2014).

## Research activities

- Worked within 6 fundamental and applied research groups.
- Published 11 international peer review and conference articles.
- Exposed results at international conferences and at main seminars in renowned universities.
- Selected for participating in 4 international workshops.
- Reviewer of the Journal of Fluid Mechanics (Cambridge Press).

## Publications

- E. HORNE et al. 2021. Variational mode decomposition for estimating critical reflected internal wave in stratified fluid. *Exp Fluids* 62, 110.
- E. HORNE et al. 2019. Particle transport induced by internal wave beam streaming in lateral boundary layers. *JFM*. 870, 848-869.
- J. SCHMITT, E. HORNE et al. 2015. An improved variational mode decomposition method for internal waves separation. *Eusipco*.
- E. HORNE AND P. MININNI 2013. Sign cancellation and scaling in the vertical component of velocity and vorticity in rotating turbulence. *Phy Rev E*. 88, 013011.

### Selection of conference proceedings

- E. HORNE et al 2019. Upward and downward transfer of energy in rotating stratified flows. *72nd Annual Meeting of the APS Division of Fluid Dynamics*. Seattle, USA.
- E. HORNE et al. 2016. Energetics aspects in Direct Numerical Simulations of a turbulent stratified flow: irreversible mixing. *VIIIth International Symposium on Stratified Flows*. San Diego, USA.

## Miscellaneous

**Field campaigns:** Andes, Antarctica and Atlantic ocean.

**Sports:** Biking, climbing, tennis, football, swimming, skiing, underwater hockey.

**Sailing • Cinema • Photography • Geopolitics • Woodworking.**