Personal information:
· Argentinean and French citizen
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· born: 05.02.1985

Ernesto Horne

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

Professional experience

(2022–)   Teraki GmbH, Berlin, Germany.
Senior Research and Development

• Leading the radar remote sensing group and model-development for Advance Driver-Assistance Systems.

(2021)   École Normale Supérieure de Lyon, Physics Lab, France. Collaboration with GFZ Centre for Geosci.
Postdoctoral research associate in modelling of boundary layer and aerodynamics of cyclists.

• Optimized physical parameters to reduce drag of the french-team cyclist competing in the Olympics 2024.

(2017–2020)   École Polytechnique, LadHyX, Paris, France
Postdoctoral research associate in large scale turbulence and geophysical flows

• Successfully planned, developed and implemented a novel experimental setup for demonstrating a theoretical model for global geophysical flow-predictions.

(2016–2017)   École Centrale, Lyon, France
Postdoctoral research associate in modelling of environmental flows

• Verified stratified flow processes by developing a Python post processing library for analysing large datasets.

(2007–2009)   Universidad de Buenos Aires, Geology Department, Argentine
Undergradute researcher

• Developed stations for measuring observational volcanic seismic data for volcanic forecast.

Education

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

(2012–2015)   École Normale Supérieure de Lyon, Physics Lab., France.

• PhD, Geophysical Fluid Dynamics: "Transport properties of internal gravity waves", *Thesis graded with honours*.

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

• Masters Thesis: *Numerical modelling in fluids*. "Cancellation exponent in rotating flows", graded 10/10.
• Degree studies: *Sc. Physics* (equivalent to Bachelor and Masters degree). Major in fluid dynamics.

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++), parallel (MPI) and cloud computing.

Data visualization: Matplotlib, Seaborn and large numerical simulation rendering.

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

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

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).

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*.

Publications

Selected articles
- 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.

Selected 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.

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).

Languages

Spanish: Mothertongue.
English: Fluent: 5 years residence in California (1989-1994). Working language for over 10 years.
French: Fluent: 7 years residence in France (2012-2020). Working language.
German: B1, initial courses and living in Germany. Eager to improve.

Miscellaneous

Field campaigns: Andes, Antarctica and Atlantic ocean.
Sports: Biking, climbing, tennis, football, swimming, skiing, underwater hockey.
Sailing · Cinema · Photography · Geopolitics · Woodworking.