Ernesto Horne

Personal information: Argentinean and French citizen • born 05.02.1985
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Work experience

(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.
• Worked with numerical simulations and performed advanced analytic and data visualization.
• Conducted fundamental research and modelling in geophysical fluid dynamics.

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

• Developed a post processing library for analysing direct numerical simulations of mixing in stratified turbulence.
• Worked in multiple-discipline collaborations.

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

• Developed observational stations for measuring and contrasting volcanic seismic activity with models.

Education

(2012–2015) **École Normale Supérieure de Lyon**, Physics Lab, France
Doctor of Philosophy, *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)
Majors in fluids dynamics and Earth sciences

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*.

Research activities

• Worked within 5 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, J. Schmitt, N. Pulstelnyk, S. Joubaud, P. Odier. Variational mode decomposition for estimating critical reflected internal wave in stratified fluid (accepted in Experiments in fluids 2021).
- E. Horne, F. Beckebanze, D. Micard, P. Odier, L. Maas, S. Joubaud. Particle transport induced by internal wave beam streaming in lateral boundary layers. *(JFM)*. 2019. Vol. 870 pp. 848-869.
- J. Schmitt, E. Horne, N. Pulstelnyk, S. Joubaud, P. Odier. An improved variational mode decomposition method for internal waves separation. *Eusipco 2015*.
- E. Horne and P. Mininni. Sign cancellation and scaling in the vertical component of velocity and vorticity in rotating turbulence. *Physical Review E*. 2013, 88, 013011.

Selection of conference proceedings

- E. Horne, M.H. Hamede J.M. Chomaz, P. Billant. Upward and downward transfer of energy in rotating stratified flows. *72nd Annual Meeting of the APS Division of Fluid Dynamics*. Seattle, USA, 2019.
- E. Horne, A. Delache, L. Gostiaux. Energetics aspects in Direct Numerical Simulations of a turbulent stratified flow: irreversible mixing. *VIIIth International Symposium on Stratified Flows*. San Diego, USA, 2016.
- E. Horne, D. Micard, S. Joubaud, P. Odier. Internal waves interacting with particles in suspension.. *International Congress of Theoretical and Applied Mechanics*. Montreal, Canada. 2016.

IT-Skills

High-level programming: Proficient in Matlab, Python, Latex and Version Control Systems.
Numerics and big data: Experienced running and analysing large numerical simulations. Advanced in data visualization. Familiar with high-performance computing (Fortran, C++) and large-scale parallel applications (MPI).
Website design: Developed an educative physics website and a personal professional website.

Languages

Spanish: Mothertongue.
English: Fluent: 5 years residence in California (1989-1994). 9 years working language.
French: Fluent: 7 years residence in France (2012-2020).
German: B1, initial courses and multiple travels to 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).

Academic reference

Pablo Mininni, Researcher of CONICET. Professor at Department of Physics, UBA, Argentina. mininni@df.uba.ar
Philippe Odier, Maître de Conference (associate professor), ENS de Lyon, France. philippe.odier@ens-lyon.fr
Thierry Dauxois, Directeur de Recherche CNRS at ENS de Lyon, France. thiery.dauxois@ens-lyon.fr

Miscellaneous

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