Kalyan Shrestha, Ph.D.

School of Oceanography, University of Washington
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Professional Experience

Nov 2019-present	Postdoctoral Research Scientist **University of Washington, Seattle, Washington, USA** Project : *Submesoscale sea ice-ocean interaction in marginal ice zones* [PI: Dr. Georgy Manucharyan]
Dec 2015-Oct 2019	Postdoctoral Research Associate **The University of Texas at Dallas, Richardson, Texas, USA** Project (2015-2017) : *Open-coastal ocean connectivity through bottom boundary layer observations and LES modeling* Project (2017-2019): *Mixing in the Texas coastal zone through coordinated simulations and field measurements : The role of Langmuir cells in sediment suspension and oil-mineral aggregation* [PI: Dr. William Anderson]
Oct 2012-Nov 2015	Research Assistant **Lille 1 University of Sciences and Technologies, Lille, France** Project : *Simulation of wall-bounded turbulent convective flows by Finite Volume Lattice Boltzmann Method* [PIs: Dr. Gilmar Mompean, Dr. Enrico Calzavarini]

Education

2015	Ph.D. in Mechanical Engineering **Lille 1 University of Sciences and Technologies, Lille, France** Thesis : *Simulation of wall-bounded turbulent convective flows by Finite Volume Lattice Boltzmann Method* [Advisers: Dr. Gilmar Mompean, Dr. Enrico Calzavarini]
2011	MSc. in Computational Fluid Dynamics **Cranfield University, Bedfordshire, UK** Thesis: *Investigation of the accuracy of RANS models for under-expanded jet injected into a supersonic cross-flow* [Adviser: Dr. Ben Thornber]
2009	B.E. Degree in Aeronautical Engineering **Hindustan College of Engineering (affiliated to Anna University), Chennai, India** Thesis : *Design and fabrication of two-seater, experimental, amateur-built aircraft from scratch* [Adviser: P S Venkatanarayanan]

Additional Scientific Experience

Manuscript Review : Journal of Fluid Mechanics

(2016-present) Member: American Physical Society - Division of Fluid Dynamics, American Geophysical Union.

(Nov 20, 2017) Session Chair: G39 Turbulence- Atmospheric Boundary Layer, American Physical Society, Denver, CO, USA.

(April 18, 2017) Judge: Undergraduate Research Scholar Awards poster contest, The University of Texas at Dallas, TX, USA.

(Feb 9-11, 2009) Student Representative from Hindustan College of Engineering at International Seminar – Aero India, Bangalore, India.

Research Interests

Oceanic and Atmospheric Turbulence, Computational Physics, Aerospace Engineering

Professional Courses and Trainings

(Jan 2019) Responsible Conduct of Research (RCR) Professional Series certification, The University of Texas at Dallas, USA.

(June 22-26, 2015) CEA-EDF-INRIA Numerical Analysis Summer School: Lattice Boltzmann Schemes, Castle of Cadarache, France.

(June 2007-Dec 2008) Diploma Course in Computer Aided Design – PROfessional, CADDAM Technologies (P) Ltd., Chennai, India.

(June 15-25, 2007) Flight Laboratory training course – "Introduction to flight experiments", Indian Institute of Technology – Kanpur, India.

Volunteering Experience

(2018-2019) Lead and teach Mathematics class for K-8 students in a Nepali Pathshala (School) organized by North Dallas Nepalese Society, Dallas, Texas.

Honors and Awards

(2020) Listed in "Who is Who in Science, Technology and Innovation of Nepal" published by Nepal Academy of Science and Technology (NAST), Nepal.

(2019) Honoured with Nepal Bidhyabhusan Padak "Ka" medal and certificate by the Honourable President of Nepal.

(2012-2015) Ph.D. scholarship funded by a collaboration between academic and industrial partners promoted by the organization INNOCOLD (*www.innocold.org*).

(2011) MSc in Computational Fluid Dynamics (Cranfield University, UK) Scientific Visualization Prize for the academic year 2010/11.

(2010-2011) Course director's Master's scholarship worth £5000.

(2009) Letter of appreciation from Hindustan University (India) for designing and fabricating the first student-built two-seater, experimental aircraft in India.

Journal Publications

Shrestha K, Manucharyan G (2021) Basal melting due to submesoscale eddy-driven vertical advection of heat in ice shelf cavities of the Amundsen Sea, Antarctica. *Geophysical Research Letters*, (*In Preparation*).

Shrestha K, Manucharyan G (2021) Parameterization of submesoscale mixed layer restratification under sea ice. *Journal of Physical Oceanography*, (*Under Review*).

Shrestha K, Anderson W (2020) Coastal Langmuir circulations induce phase-locked modulation of bathymetric stress. *Environmental Fluid Mechanics* **20**, pp.873–884.

Shrestha K, Anderson W, Tejada-Martinez A, Kuehl J (2019) Orientation of coastal-zone Langmuir cells forced by wind, wave, and mean current at variable obliquity. *Journal of Fluid Mechanics* **879**, pp.716–743.

Anderson W, Yang J, **Shrestha K**, Awasthi A (2018) Turbulent secondary flows in wall turbulence: vortex forcing, scaling arguments, and similarity solution. *Environmental Fluid Mechanics* **18**(6), pp.1351–1378.

Shrestha K, Anderson W, Kuehl J (2018) Langmuir turbulence in coastal zones : structure and length scales. *Journal of Physical Oceanography* **48**(5), pp.1089–1115.

Ibanez R, Kuehl J, **Shrestha K**, Anderson W (2018) Brief Communication : A nonlinear self-similar solution to barotropic flow over varying topography. *Nonlinear Processes in Geophysics* **25**(1), pp.201–205.

Shrestha K, Mompean G, Calzavarini E (2016) Finite-volume versus streaming-based Lattice Boltzmann algorithm for fluid-dynamics simulations: A one-to-one accuracy and performance study. *Physical Review E* **93**(2), 023306.

Conferences, Symposiums and Seminar Talks (*Presenting author)

Shrestha K* (2021) Submesoscale mixed layer restratification under sea ice. *Physical Oceanography Seminar, School of Oceanography, University of Washington, WA*.

Shrestha K* (2020) Characteristics of Langmuir turbulence in coastal zones. *Physical Oceanography Seminar, School of Oceanography, University of Washington, WA*.

Shrestha K*, Anderson W (2019) Predicting orientation of coastal-zone Langmuir cells influenced by misaligned current, wind and wave forcing. *Bulletin of the American Physical Society, Seattle, WA*, abstract #BAPS.2019.DFD.G 39.2.

Shrestha K* (2019) Characteristics of coastal Langmuir turbulence and a novel finite volume Lattice Boltzmann algorithm. *Invited seminar talk, Mechanical Engineering Department Seminar, The University of Texas at San Antonio, TX*.

Shrestha K*, Anderson W, Kuehl J (2019) Role of Langmuir cells in setting heterogeneity in the bottom bed stress map in shallow water. *Bluebonnet Symposium on Thermal-Fluid Sciences, Southern Methodist University, Dallas, TX*.

Kuehl J*, Anderson W, **Shrestha K** (2019) Response driven fundamental science questions : Coastal Langmuir circulations, deep transport pathways and a coral mortality event. *Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA*, abstract #P-013-004.

Shrestha K*, Kuehl J, Anderson W (2018) Numerical study on the heterogeneous bottom bed stress map due to coastal Langmuir circulations. *Bulletin of the American Physical Society, Atlanta, GA*, abstract #BAPS.2018.DFD.Q 35.5.

Shrestha K*, Anderson W, Kuehl J (2018) Coastal Langmuir circulations under misaligned currents, wind, and wave forcing. *Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA*, abstract #RSP-002-03.

Shrestha K*, Anderson W, Kuehl J (2017) Impact of wind-wave-current obliquity on the form and orientation of coastal Langmuir circulations. *American Geophysical Union Fall Meeting, New Orleans, LA*, abstract #NG21A-0124.

Ibanez R*, Kuehl K, **Shrestha K**, Anderson W (2017) A nonlinear self-similar solution to barotropic flow over rapidly varying topography. *Bulletin of the American Physical Society, Denver, CO*, abstract #BAPS.2017.DFD.Q32.2.

Shrestha K*, Kuehl J, Anderson W (2017) Understanding the dimensional and mechanical properties of coastal Langmuir circulations. *Bulletin of the American Physical Society, Denver, CO*, abstract #BAPS.2017.DFD.E39.1.

Shrestha K*, Anderson W, Kuehl J (2017) Characteristics of coastal Langmuir turbulence. *Bluebonnet Symposium on Thermal-Fluid Sciences, Southern Methodist University, Dallas, TX*.

Shrestha K*, Anderson W, Kuehl J (2017) Kinematic differences of Langmuir circulations in open and coastal zones. *Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA*, Poster Number #140.

Shrestha K*, Anderson W, Kuehl J (2016) Numerical study of factors controlling intensity and spatial extent of Langmuir Circulations in coastal zones. *American Geophysical Union Fall Meeting, San Francisco, CA*, abstract #OS23B-2022

Shrestha K*, Mompean G, Calzavarini E (2016) Simulation of wall-bounded turbulent convective flows by Finite Volume Lattice Boltzmann method. *Thermal-Fluid Sciences Graduate Seminar Series, Mechanical Engineering Department, The University of Texas at Dallas, Richardson, TX*.

Shrestha K*, Mompean G, Calzavarini E (2014) Can Finite-Volume Lattice Boltzmann outperform Streaming-based algorithm in fluid-dynamics simulations ? A one-to-one accuracy and performance study. 23^{rd} *International Conference on Discrete Simulation of Fluid Dynamics, Paris, France*.

Shrestha K*, Mompean G, Calzavarini E (2014) Lattice Boltzmann Method for fluid flows. *Journee des Doctorants 2014 (Doctoral Day), North of France, Lille, France*.

***Updated** : May 14, 2021*