

# Kalyan Shrestha, Ph.D.

School of Oceanography, University of Washington  
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## Professional Experience

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- Nov 2019-present      Postdoctoral Research Associate  
**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 (Texas General Land Office Contract #16-019-0009283)*  
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 (Texas General Land Office Project Contract #18-130-000-A670)*  
[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

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- 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: Prof. P S Venkatanarayanan]

## Additional Scientific Experience

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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.

## Professional Courses and Trainings

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(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

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(2018-2019) Lead and teach mathematics class for children up to middle school in a Nepali Pathshala (Nepali school) organized by North Dallas Nepalese Society, Dallas, Texas.

## Honors and Awards

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(2019) Honoured with Nepal Bidhyabhusan Padak “Ka” medal and certificate by the honourable President of Nepal.

(2012-2015) PhD scholarship funded by a collaboration between academic and industrial partners promoted by the organization INNOCOLD ([www.innocold.org](http://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 first student-built two-seater, experimental aircraft in India.

## Journal Publications

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**Shrestha K**, Anderson W (2019) Coastal Langmuir circulations induce phase-locked modulation of bathymetric stress. *Environmental Fluid Mechanics*, pp.716–743, <https://doi.org/10.1007/s10652-019-09727-4>.

**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)

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**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.G39.2.

**Shrestha K\*** (2019) Numerical Study of coastal Langmuir turbulence. *Brown Bag Thermal-Fluid Sciences Seminar Series, Mechanical Engineering Department, The University of Texas at Dallas, Richardson, TX*.

**Shrestha K\*** (2019) Characteristics of coastal Langmuir turbulence and a novel finite volume Lattice Boltzmann algorithm. *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.Q35.5.

**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<sup>rd</sup> International Conference on Discrete Simulation of Fluid Dynamics, Paris, France*.

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