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Paban Kumar Bhuyan

Curriculum Vitae

Last Updated: November 27, 2025

Research Interests: Submesoscale Dynamics, Observational Oceanography

Education

2021 -present **PhD in Physical Oceanography**, *Department of Marine Sciences, University of Connecticut*, CT, USA

2018 –2020 **M.Tech in Climate Science and Technology**, *School of Earth, Ocean and Climate Sciences (SEOCS) Indian Institute of Technology Bhubaneswar*, India
Dissertation: Characteristics of Coastal Current and Associated Processes in the Bay of Bengal.

2011 – 2015 **B.Tech in Civil Engineering**, *Government College of Engineering Kalahandi*, Odisha, India

Research Experience

2020 – 2021 **Junior Research Fellow** , Deptt. of Applied Mechanics, IIT Delhi
A numerical study of submesoscale processes driven by river plumes in the Bay of Bengal Region.
Advisor: Dr. Vamsi Krishna Chalamalla.
Sponsoring agency: Science and Engineering Research Board (SERB), DST

March 2019 – January 2020 **Researcher**, *SEOCS, IIT BBS*, India
Quality Control of HF Radar Surface Currents for the investigation of sub-mesoscale Coastal Process and its use for assimilation in the INCOIS Model. Advisor: Dr. Sourav Sil
Sponsoring agency: Indian National Centre for Ocean Information Services (INCOIS)

Fellowships

2025 Andrew J. Nalwalk Memorial Award ($230)

2023 UConn Doctoral Student Travel Award ($300)

2018-2020 MHRD Fellowship for Master's Research

2011-2015 Foundation for Excellence Scholarship for Undergraduate Studies

Publications

2025 Bhuyan, P., Rocha, C.B., Romero, L. and Farrar, J.T.: Acoustic Doppler Current Profiler Measurements from Saildrones, with Applications to Submesoscale Studies. (In review for Journal of Atmospheric and Oceanic Technology)

2025 Farrar, T. and 37 coauthors (alphabetical), including Paban Bhuyan: S-MODE: the Sub-Mesoscale Ocean Dynamics Experiment.

2025 Patterson, R.G. and 51 coauthors, including Paban Bhuyan: Uncrewed Surface Vehicles in the Global Ocean Observing System: A New Frontier for observing and monitoring at the air-sea interface.

Skills Acquired

Programming Good Working Knowledge in Python, Matlab, C++, R, Julia, Fortran, Bash Scripting.

Software Arduino, Git, GitHub, Vim, CDO, GrADS, PARCELS, ODV, Panoply, ParaView, Ferret, SNAP, ROMS (CROCO and Rutgers version), developing xroms-croco(https://github.com/pocean23/xroms-croco).

Workshop Attended

2024 Tracer mixing summer school at BRIN Mathematics centre, University of Maryland, July 07-19. Project: Surface to Bottom Connections in Earth's Ocean

2024 MicroRider WireWalker training (Virtual), Rockland Scientific International

2024 Hands-on Workshop and Discussion Meeting on Geophysical Flows: From the Field to the Lab, IIT Madras, India

2023 NASA Openscape: Openscapes Champions Lesson Series, April - June, 2023 doi.org/10.5281/zenodo.7407246

2023 NSF 1-day Bystander intervention workshop.

2023 Bystander intervention workshop at Gordon Research Conference.

2023 Hyperspectral Remote-Sensing Workshop, Headwall, July 11-12.

2020 Artificial Intelligence for Earth System Science (AI4ESS) Summer School, NCAR, Boulder, Colorado, USA (Virtually).

2019 Discovery and Use of Operational Ocean Data Products and Services, Jointly Organised by the UNESCO/IOC IODE and INCOIS-ITCOcean, Hyderabad, India.

2019 Use of Earth Observation data for improved Urban Environmental Monitoring, Jointly Organised by IIT BBS and the University of Southampton, IIT Bhubaneswar, India.

2019 Neural Network Machine Learning Bootcamp, IIT Bhubaneswar, India.

2019 TERI – NORCE Research School on Data Science in Climate Research: Perspectives on Climate Extremes, New Delhi, India.

2019 CHAPNET-2019: International Workshop on Advanced Machine Learning Techniques for Climate Informatics, (GRSS, IEEE), ISI- Kolkata, India.

Field Experience

1 Recovery Cruise for MABIWs (2-4 October 2023): Assisted in the recovery of the deployed platform.

2 Mid-Atlantic Bight Internal Waves (MABIWs) Cruise (17-20 July 2023): Participated in T-string and bottom lander mooring deployments at the 35m and 50m isobaths. Conducted sea-saw CTD casting using a fishing rod.

3 S-MODE Experiment (April 2023): Operated WaveGliders for the month-long experiment. Responsibilities included monitoring ship lanes for deconflicting WaveGliders with incoming ships.

4 IIT Bhubaneswar - State Pollution Control Board Joint Program (2 days on R/V Sagar Utkal). Conducted for Observational Data collection using CTD and Current meter from Bay of Bengal (Paradeep Coast).

5 Visit to Indian Meteorological Department for launching of Radiosonde, and to study different observational instruments for rainfall, solar irradiance, temperature, and humidity measurements.

Leadership and Engagement

[2025] Presented interactive wave flume demonstrations at Sip n' Science, engaging the public in concepts of Stokes drift, wave frequency, and wavelength to promote ocean science awareness.

[2024] Presented advancements in ocean exploration technologies at Sip n' Science, a public outreach event focused on engaging the community and promoting awareness of ocean science.

[2024] Gave an informal talk on the use of Saildrones for submesoscale studies at the Department of Atmospheric and Oceanic Science, University of Maryland

[2023-2024] Host, Physical Oceanography Paper Discussion Meeting, Department of Marine Sciences, UConn Avery Point. Facilitate regular meetings for the discussion of recent publications and advancements in the field of physical oceanography, promoting academic dialogue and collaboration among faculty and students.

Teaching Experience

1 Delivered 4 lectures for the "Introduction to Oceanography (MARN1002)" course in Fall 2023. Class size: 31 students. Topics covered: Temperature, Salinity, and Density of seawater, along with the Coriolis effect, pressure systems, and their influence on global salinity patterns.

2 Delivered guest lecture on sound waves, and doppler effect for the "Intro to Physics (Phy1010Q)" course during the Spring 2024 semester.

3 Served as a teaching assistant for the "Physics Lab (Phy1010Q)" course during Fall 2023 and Spring 2024 semesters.

Mentoring

2024-2025 **Mentoring Undergraduate Student: Hiryu Shinand**, *Department of Marine Sciences, UConn Avery Point. Guided Hiryu in developing an Arduino-based pressure sensor for short-wave measurements in the coastal region and analyzing the collected data.*

2023-2024 **Mentoring Undergraduate Student: Vicki You**, *Department of Marine Sciences, UConn Avery Point. Guided her in the development of a buoy sensor for wave measurements, utilizing the GPS/IMU (VN200) sensor and Arduino Nano.*

2022 **Mentored Undergraduate Student: Vicki You**, *Guided her research on characterizing the compensation of temperature (T) and salinity (S) variations in ocean fronts using data from the S-MODE Pilot experiment*

Conferences

28-29 May 2025 **S-MODE Science Team Meeting (Talk)**, *Paban Bhuyan, Cesar Rocha, Leonel Romero, J. Thomas Farrar: Investigating Ocean Fronts and Kinetic Energy Fluxes Using Saildrone Observations*, NASA Ames Research Center, Mountain View, California

15 May 2025 **15th Biennial Feng Graduate Research Colloquium (Talk)**, *Paban Kumar Bhuyan, Cesar B Rocha, Leonel Romero, and J. Thomas Farrar: Investigating Ocean Fronts and Kinetic Energy Fluxes Using Saildrone Observations"*, Department of Marine Sciences, University of Connecticut

22-24 October 2024 **S-MODE Science Team Meeting (Poster)**, *Paban Bhuyan, Cesar Rocha, Leonel Romero, J. Thomas Farrar: Submesoscale Frontogenesis Observed Using an Array of Saildrones*, NASA Ames Research Center, Mountain View, California

18-23 February 2024 **Ocean Sciences Meeting (Poster)**, *Paban Bhuyan, Cesar Rocha, Leonel Romero, J. Thomas Farrar: Validating Saildrone ADCP Measurements for High-Resolution Submesoscale Observations*, New Orleans, LA

7-9 November 2023 **S-MODE Science Team Meeting (Talk)**, *Paban Bhuyan, Cesar Rocha, Leonel Romero, J. Thomas Farrar: Saildrones for Submesoscales*, NASA Ames Research Center, Mountain View, California

17-23 June 2023 **Gordon Research Conference and Seminar on Coastal Ocean Dynamics (Poster)**, *Paban Kumar Bhuyan, Cesar B Rocha, Leonel Romero, and J. Thomas Farrar: Saildrone ADCP Measurements for Submesoscale Studies*

18 May 2023 **14th Biennial Feng Graduate Research Colloquium (Talk)**, *Paban Kumar Bhuyan, Cesar B Rocha, Leonel Romero, and J. Thomas Farrar: Validating Saildrone ADCP Measurements for High-Resolution Submesoscale Observations: Accuracy and Noise Analysis"*, Department of Marine Sciences, University of Connecticut

9 – 13 December 2019 **AGU Fall meeting (Poster)**, *Paban Kumar Bhuyan, Samiran Mandal and Sourav Sil: Characterization of the East India Coastal Current using a Drifter, HF Radars and Altimetry during October – November 2015*, https://doi.org/10.1002/essoar.10501913.1

17-19 December 2019 **AdCoRe IP-2019 (Talk)**, *Paban Kumar Bhuyan and Sourav Sil: Inter-annual Variation of Salinity Associated with Boundary Currents in the Bay of Bengal. "International Symposium on Advances in Coastal Research with Special Reference to Indo Pacific-2019"*, https://doi.org/10.5281/ZENODO.3813029

12-14 December 2019 **OSICON – 19 (Poster)**, *Paban Kumar Bhuyan, Samiran Mandal and Sourav Sil: Characterization of the East India Coastal Current using a Drifter, HF Radars and Altimetry. "Sixth Biennial Conference of Ocean Society of India"*

12-14 December 2019 **OSICON – 19 (Talk)**, *Rahul Deogharia, Samiran Mandal, Paban Kumar Bhuyan, and Sourav Sil: A kriging based approach to restoration of HF radar derived ocean surface currents. "Sixth Biennial Conference of Ocean Society of India"*