



RATNAKSHA LELE

PhD Candidate [ratnaksha.github.io](https://github.com/ratnaksha) | rlele@ucsd.edu

Doctoral student studying large-scale ocean circulation and linkages to global climate using observational and remote sensing data. Strong background in time series analysis, signal processing, optimization, statistical modelling, analysis and viz of large datasets, and working in a collaborative research environment. Seeking internship opportunities to apply data-driven frameworks to impactful real-world problems and decision-making.

EDUCATION

UC SAN DIEGO

PhD in Oceanography
Expected 2023

UC SAN DIEGO

Master of Science
Physical Oceanography
Dec 2018

VIT UNIVERSITY

Bachelor of Technology
Mechanical Engineering
June 2016

SKILLS

Programming 5+ yrs:

Python • MATLAB • C

ML frameworks:

Sklearn • PyTorch

Familiar:

R • SQL • ArcGIS

COURSEWORK

Recommender Sys. and Web Mining
Statistical Learning
ML for Physical Applications
Data Analysis Methods I, II & III
Applied Mathematics I, II & III
Probability and Statistics
Applied Numerical Methods
Operations Research

LINKS



[www.github.com/ratnaksha](https://github.com/ratnaksha)



www.linkedin.com/in/ratnakshalele

WORK EXPERIENCE

SCRIPPS INSTITUTION OF OCEANOGRAPHY | PhD CANDIDATE

AUG 2016 – PRESENT

- Quantified uncertainty in the role of turbulence in deep ocean circulation to within a factor of 3 by applying advanced signal processing, statistical algorithms and feature engineering on novel deep-ocean turbulence measurements (χ_{pod}) in MATLAB and Python. Contributed to NSF-funded program to make above data public to improve future climate model predictions and reliability.
- Implementing Embedded Clustering on oceanographic observational data using Non-Negative Matrix Factorization and Gaussian Mixture Models to uncover spatial distribution in the regimes of turbulence-driven mixing in the ocean.
- Improving inference and predictability of ocean dynamics at high resolution by training deep neural network models on remotely sensed data from NASA's GRACE mission– to advance the understanding of global spatiotemporal variability in deep ocean currents and response to climate change.

WOODS HOLE OCEANOGRAPHIC INSTITUTION | RESEARCH FELLOW

JUNE 2015 – APRIL 2016

- Implemented time-series and spectral methods on in-situ Ice Tethered Profiler (ITP) sea-ice data, field and satellite observations to understand the dynamics and seasonal variation in sea-ice momentum and energy transfer.
- Discovered disparities in outdated ocean model parameterizations of sea-ice compared to new field observation. Recommended updating parameterization to reflect changing sea-ice conditions in the Arctic; now published in *Elementa: Science of the Anthropocene*. [[pdf](#)]

INDIAN INSTITUTE OF SCIENCE | RESEARCH FELLOW

JUNE 2014 – AUGUST 2014

- Analyzed tropical cyclone data from satellite observations and provided R&D for a better tropical cyclone feature detection and tracking algorithm by feature weighting multiple variables in cyclone potential vorticity dynamics.

AWARDS

2020 NASA Future Investigator in Earth and Space Science Fellowship Grant
2020 NASA JPL Center for Climate Science Summer School
2017 Departmental Travel Award for Research Excellence
2016 UC San Diego Regents Fellowship
2016 VIT University Special Achiever Award
2015 Woods Hole Oceanographic Institution Summer Student Fellowship
2014 Indian Academy of Sciences Summer Research Fellowship

PUBLICATIONS

[1] R Lele, S G Purkey and J A MacKinnon, Global Regimes of Turbulent Mixing using Unsupervised Embedded Clustering of Hydrographic Data, Geophysical Research Letters, in prep.

[2] J D Nash, **R Lele**, J A MacKinnon, S G Purkey, et al. Estimating χ using fast-response thermistors on traditional shipboard CTDs: sources of uncertainty and bias. Journal of Atmospheric and Oceanic Technology, in review.

[3] **R Lele**, S G Purkey, J D Nash, J A MacKinnon, A M Thurnherr, C B Whalen, et al. Abyssal Heat Budget in the Southwest Pacific Basin. Journal of Physical Oceanography, 2021. [[pdf](#)]

[4] Sylvia T Cole, John M Toole, **Ratnaksha Lele**, Mary-Louise Timmermans, Shawn G Gallaher, Timothy P Stanton, William J Shaw, Byongjun Hwang, Ted Maksym, Jeremy P Wilkinson, et al. Ice and ocean velocity in the arctic marginal ice zone: Ice roughness and momentum transfer. Elementa Science of the Anthropocene, 5, 2017. [[pdf](#)].

[5] **R Lele**. An investigation into arctic sea-ice dynamics and energetics. Report submitted in partial fulfillment of the WHOI Summer Student Fellowship, 2015.

CONFERENCE PRESENTATIONS

R Lele et al, Abyssal Mixing in the South West Pacific Basin. Ocean Sciences Meeting, San Diego CA, Feb 2020, **Talk**.

R Lele et al, Recipes of Turbulent Mixing from the South Pacific. Gordon Research Conference on Ocean Mixing, Andover NH, June 2018, **Poster**.

R Lele et al, Decadal Changes in the Properties and Transport of AABW at 32oS in the Southwest Pacific Basin. Ocean Sciences Meeting, Portland OR, Feb 2018, **Talk**.

R Lele and SG Purkey Antarctic Bottom Water Warming in the South West Pacific Basin. Graduate Climate Conference, Woods Hole MA, Nov 2017, **Poster**.

R Lele et al, An Investigation into Arctic Sea-Ice Dynamics and Energetics. Ocean Sciences Meeting, New Orleans LA, Feb 2016, **Talk**.

TEACHING EXPERIENCE

Introduction to Physical Oceanography SIO-210
Introduction to Programming in C ITE-101

Teaching Assistant
Teaching Assistant

Fall 2020
Fall 2012

OCEANIC FIELDWORK EXPERIENCE

HLY-1803 Experiment in the Beaufort and Chukchi Seas
GO-SHIP P06 Leg-1 in the South Pacific
La Jolla Internal Tide Experiment

US Coast Guard Cutter Healy
RVIB Nathaniel B. Palmer
R/V Sally Ride

Oct-Nov 2018
Jul-Aug 2017
Dec 2016