Hemant Khatri

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Research Interests

Turbulence in the oceans and atmosphere, impacts of topography on the ocean circulation, heat and tracer transport by eddies.

Education

2015 – 19 **Ph.D., Mathematics**, Imperial College London, UK
Thesis: *Dynamics of ocean jets over topography*
Advisor: Pavel Berloff

2013 – 15 **M.Sc., Atmospheric & Oceanic Sciences**, Indian Institute of Science (IISc), India
Thesis: *Mesoscale turbulence on the ocean surface from satellite altimetry*
Advisor: Jai Sukhatme | CGPA: 7.2/8

2009 – 13 **B.E., Chemical Engineering**, Birla Institute of Technology & Science (BITS), India
CGPA: 8.3/10, *First Class Honours*

Professional Experience

Sep'21 – Present **Research Associate**, Earth, Ocean and Ecological Sciences, University of Liverpool, UK

Oct'19 – Sep'21 **Postdoctoral Research Associate**, Atmospheric & Oceanic Sciences (AOS), Princeton University, USA

Feb'19 – Aug'19 **Modelling Associate (Intern)**, Risk Management Solutions, London, UK

Jan'13 – Jun'13 **Research Assistant**, TIFR Centre for Interdisciplinary Sciences, India

Technical Skills

Operating System	Linux, UNIX, Windows
Programming	Python, R, Fortran, MATLAB, C/C^{++}, git, QGIS
Numerical Modeling	Experience of running MOM6 general circulation model, and working with spectral and finite-difference scheme models
Data Analysis	Experienced in using xarray and dask modules in python for analyzing climate model outputs, atmospheric and oceanic reanalysis datasets

Fellowships and Awards

Oct'19 – Sep'21 **CIMES Postdoctoral Fellowship**, Princeton University, USA

Oct'16 – Jul'19 **Research Grants**, Mathematics for Planet Earth, Imperial College London, UK

Feb'16 – Jul'19 **President's PhD Scholarship**, Imperial College London, UK

Jan'14 – Jun'15 **Jeremy Grantham Fellowship**, Divecha Centre for Climate Change, IISc, India

Aug'13 – Oct'15 **GATE Fellowship**, Ministry of Education, India

Aug'11 – Jun'13 **Merit-cum-Need Scholarship**, BITS Pilani, India

Teaching & Mentorship

Guest Lecturer	Atmospheric and Oceanic Wave Dynamics (Feb 2020)
Teaching Assistant	Mathematical Methods, Multivariable Calculus, Numerical Analysis (2016–18), Geophysical Fluid Dynamics (Spring 2015)
Teaching Transcript	McGraw Center for Teaching and Learning, Princeton University
Mentor	Jack Davies, Co-advised on his Masters thesis project (2019)

Publications

- Khatri, H., Griffies, S., Uchida, T., Wang, H. and Menemenlis, D. (2021). Role of mixed-layer instabilities in the seasonal evolution of eddy kinetic energy spectra in a global submesoscale permitting simulation, *Geophysical Research Letters*.
- Davies, J., Khatri, H. and Berloff, P. (2021). Linear stability analysis for flows over sinusoidal bottom topography, *Journal of Fluid Mechanics*.
- Khatri, H. and Berloff, P. (2019). Tilted drifting jets over a sloped topography: effects of vanishing eddy viscosity, *Journal of Fluid Mechanics*.
- Khatri, H. and Berloff, P. (2018). Role of eddies in the maintenance of multiple jets embedded in eastward and westward baroclinic shears, *Fluids*.
- Khatri, H. and Berloff, P. (2018). A mechanism for jet drift over topography, *Journal of Fluid Mechanics*.
- Khatri, H., Sukhatme, J., Kumar, A. and Verma, M. K. (2018). Surface ocean enstrophy, kinetic energy fluxes, and spectra from satellite altimetry, *Journal of Geophysical Research: Oceans*.

Conferences

- Dynamics of ocean jets formed over a sloped topography, *Workshop "Conservation Principles, Data, and Uncertainty in Atmosphere-Ocean Modelling", Potsdam, Germany*. (Poster, Apr'19)
- Ocean surface turbulence: Is it QG or surface-QG like?, *CliMathNet Conference, Reading, UK*. (Talk, Sep'18)
- Dynamics of ocean jets formed over a sloped topography, *Gordon Ocean Mixing Conference, Andover, USA*. (Poster, Jun'18)
- Ocean surface spectral fluxes of kinetic energy, enstrophy and buoyancy, *Gordon Ocean Mixing Conference, Andover, USA*. (Poster, Jun'18)
- Drifting quasi-zonal jets, *Rotating Fluids Meeting, University of Oxford, UK*. (Talk, Sep'17)
- Effects of zonally varying topography on the dynamics of oceanic jets, *21^{st} conference on atmospheric and oceanic fluid dynamics, Portland, USA*. (Poster, Jun'17)
- Kinetic energy and enstrophy fluxes on the ocean surface, *Meeting: Energy transfers in the atmosphere and oceans, Hamburg, Germany*. (Talk, Apr'17)

Workshops & Seminars

Workshop
- Rossbypalooza – University of Chicago (Jun'18)
  Turbulent flows and climate dynamics – School of Physics, Les Houches (Aug'17)
  Global climate change – University of Exeter (Jun'14)

Seminar
- New York University, USA (Mar'20)
  Geophysical Fluid Dynamics Laboratory, Princeton, USA (Mar'19)
  Queen Mary University, London, UK (Dec'17)

Service

Reviewer
- Journal of Physical Oceanography, Ocean Modelling, Fluids, Journal of Fluid Mechanics, Journal of Advances in Modeling Earth Systems, Journal of Physics: Conference Series (IOP).

References

Dr Pavel Berloff
Reader, Department of Mathematics,
Imperial College London, UK.
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http://www.imperial.ac.uk/~pberloff/

Dr Stephen Griffies
Physical Scientist, Oceans and Climate Group,
Geophysical Fluid Dynamics Laboratory, USA.
Stephen.Griffies@noaa.gov
https://stephengriffies.github.io

Dr Jai Sukhatme
Associate Professor, Centre for Atmospheric & Oceanic Sciences,
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