

Yanxu (Sue) Chen

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EDUCATION

École Normale Supérieure

Paris

- Ph.D., Dynamics and Physics of the Atmosphere and Ocean

Dec 2018-Sep 2022

McGill University

Montreal

- M.Sc., Atmospheric and Oceanic Sciences Sep 2016-Dec 2018
- Coursework includes: Atmospheric and Oceanic Dynamics, Waves and Instability, Turbulence in Atmosphere and Oceans, Dynamics of Current Climates, Synoptic Meteorology, etc.

Sun Yat-sen University (SYSU)

Guangzhou

- B.Sc., Marine Sciences Sep 2012-Jun 2016
- GPA: 3.98/4.0 (or 91/100 in centesimal system)
- Academically ranked the first among 66 students.
- Graduated with the honour of 'Outstanding Graduate' based on the thesis and four-year academic performance.
- Coursework includes: Fluid Mechanics, Physical Oceanography, Marine Survey and Observation Techniques, Coastal Process and Engineering Application, Remote Sensing and GIS, etc.

Hong Kong University of Science and Technology (HKUST)

Hong Kong

- Summer Exchange Jun 2014-Aug 2014
- Coursework includes: Environmental Sciences, Technology and Innovations, etc.

FELLOWSHIPS AND AWARDS

2019	Chaire Chanel Research Grant	LMD-ENS
2018	Graduate Research Enhancement and Travel Award	McGill University
2017	Stephen and Anastasia Mysak Graduate Fellowship	McGill University
	Graduate Excellence Fellowship	McGill University
	Graduate Research Enhancement and Travel Award	McGill University
	Travel Grant from the World Climate Research Programme (WCRP)	WCRP
2016	Stephen and Anastasia Mysak Graduate Fellowship	McGill University
	Graduate Excellence Fellowship	McGill University
	Mitacs Globalink Graduate Fellowship	Mitacs
	Outstanding Graduate of Sun Yat-sen University (only four students from the department)	Sun Yat-sen University
2015	Sun Yat-sen University Scholarship for Outstanding Students	Sun Yat-sen University
	Research Scholarship from China Scholarship Council	China Scholarship Council
	Second Prize of the National Ocean Knowledge Competition	State Oceanic Administration of China
2014	Sun Yat-sen University Scholarship for Outstanding Students	Sun Yat-sen University
	Baogang Scholarship for Excellent Students (three students in the university)	Sun Yat-sen University
	Award from Province-based Research Training Program	Education Bureau of China

Award from National Entrepreneurship Training Program
2013 Sun Yat-sen University Scholarship for Outstanding Students
National Scholarship (only one student from the department)

Education Bureau of China
Sun Yat-sen University
Education Bureau of China

RESEARCH EXPERIENCES

- Department of Physical Oceanography, Woods Hole Oceanographic Institution** **Woods Hole**
Postdoc Investigator Sep 2022 until now
- Supervised by Dr. Lisan Yu and Dr. Viviane Menezes
 - Research keywords: air-sea interactions.
- Project 1: The imprint of ocean mesoscale dynamics on air-sea momentum and buoyancy fluxes.
Project 2: NASA's SASSIE campaign: Arctic air-sea heat budget in the Beaufort-Chukchi Seas.
- Laboratoire de Météorologie Dynamique, École Normale Supérieure** **Paris**
PhD Student Dec 2018-Sep 2022
- Supervised by Prof. Sabrina Speich
 - Research keywords: ocean mesoscale eddies, mode waters and heat uptake.
- Project: The role of ocean mesoscale dynamics in the ocean heat and carbon uptake.
- EUREC4A campagne R/V L'Atalante** **south of Barbados**
Scientific Crew Member Jan-Feb 2020
- Project: Helped with the deployment of several instruments, mainly CTD casts, uCTDs, XBTs and Argo floats; Detected homogeneous water masses with the proceeding shipborne data.
- Department of Atmospheric and Oceanic Sciences, McGill University** **Montreal**
Graduate Student Sep 2016-Dec 2018
- Supervised by Profs. David Straub and Louis-Philippe Nadeau
 - Research keywords: Ekman layer dynamics and near-inertial waves.
- Project 1: Analyzed impacts of synoptic winds on low-frequency wind stress over ocean, as well as the influence of stability (temperature) on wind stress drag coefficient.
Project 2 (thesis): Applied the flow-dependent nonlinear Ekman layer in a two-layer shallow water model and analyzed how the interior flow responds differently compared with the typical wind-induced shallow water model.
- Department of Earth and Atmospheric Sciences, University of Alberta** **Edmonton**
Summer Research Intern May 2015-Sep 2015
- Supervised by Prof. Paul Myers
 - Research keywords: the role of freshwater in high-latitude oceans.
- Project: Compared several numerical simulations to understand the potential impact of freshwater processes and surface atmospheric conditions on the ocean and sea ice around Greenland. (Quantification includes mixed layer depth, ice thickness and fluxes through major straits.)
- Institute of Coastland Estuarine Research, Sun Yat-sen University** **Guangzhou**
Undergrad Research Assistant Jan 2015-Jun 2016
- Supervised by Profs. Qingshu Yang and Huayang Cai
 - Research keywords: estuarine dynamics of the interaction between river discharge and tides.
- Project 1: Collected hydrological data of three main branches in the Pearl River Delta and analyzed the impact of El Nino and La Nina on floods of the Pearl River from the perspective of statistic analysis.

Project 2 (thesis): Combined a one-dimensional analytical model for tidal hydrodynamics with a statistical method of joint probability distribution to analyze the response of water levels to river discharge and tidal range in estuaries.

Center for Coastal Ocean Science and Technology, Sun Yat-sen University

Guangzhou

Undergrad Research Assistant

May 2014-May 2015

- Supervised by Prof. Jiaxue Wu
- Research keywords: bottom boundary layer dynamics.

Project: Analyzed five characteristics of turbulence (fluctuation intensity, eddy viscosity coefficient, frictional velocity, drag coefficient and the rate of turbulent kinetic energy dissipation) within the Pearl River Estuary bottom boundary layer and determined their temporal-spatial variations.

PUBLICATIONS

- Autumnal equinox shift in Arctic surface energy budget: Beaufort-Chukchi Seas case study (JGR Oceans, 2024). Carrigg et al.
- Signature of mesoscale eddies on air-sea heat fluxes in the North Indian Ocean (JGR Oceans, 2024) Chen and Yu
- Mesoscale meridional heat transport inferred from sea surface observations (GRL, 2024) Chen and Yu
- Dry air outbreak and significant surface turbulent heat loss during hurricane Ian: satellite and saildrone observations (GRL, 2023) Yu et al.
- Formation and transport of the South Atlantic subtropical mode water in eddy-permitting observations. (JGR Oceans, 2021) Chen, Speich and Laxenaire
- Interaction of nonlinear Ekman pumping, near-inertial oscillations, and geostrophic turbulence in an idealized coupled model. (JPO, 2021) Chen, Straub and Nadeau
- EUREC4A. (Earth System Science Data, 2021) Stevens et al.
- **prep**• Role of mesoscale eddies in global mode water distribution and ventilation. (currently revising) Chen and Speich
- **prep**• Physical phenology of air-sea heat budget for the Beaufort Sea autumn freeze-up. (under review) Chen, Menezes and Yu
- **prep**• Water mass subduction in the isopycnic coordinate. Chen et al.
- **prep**• Evaluating the role of marine boundary layer stability in the Arctic air-sea heat budget using uncrewed surface vehicles. Chen and Yu

TEACHING EXPERIENCES

- **Mentor for the Summer Student Fellow (WHOI)** Summer 2024
SSF student: Sean Barnier from Embry-Riddle Aeronautical University
- **Mentor for the Summer Student Fellow (WHOI)** Summer 2023
SSF student: Joe Carrigg from Oregon State University
- **Introduction to Oceanic Sciences (McGill)** Winter 2018
Instructor: Prof. Carolina Dufour
- **Natural Disasters (McGill)** Fall 2017
Instructors: Profs. John Gyakum and Souad Guernina
- **Pearl River Delta Field Trip (SYSU)** Fall 2015
Instructor: Prof. Yaping Lei

PRESENTATIONS

- **WHOI Physical Oceanography Seminar 2024** Woods Hole, USA
Talk: Eddy-induced air-sea coupling in momentum and heat budgets
- **Ocean Sciences Meeting 2024** New Orleans, USA
Poster: Physical phenology of air-sea heat budget in the Beaufort Sea autumn freeze-up
- **CAMAS Workshop 2024** Santa Fe, USA
Talk: Physical phenology of air-sea heat budget in the Beaufort Sea autumn freeze-up
- **Eddy Energy Annual Meeting 2023** Woods Hole, USA
Talk: Signature of mesoscale eddies on air-sea heat fluxes: strong compensation between SSH-SST coherent and incoherent eddies
- **Mesoscale and Frontal-Scale Air-Sea Interactions Workshop 2023** Boulder, USA
Talk: Signature of mesoscale eddies on air-sea heat fluxes: strong compensation between SSH-SST coherent and incoherent eddies
- **Imaginary Futures Workshop (Arts and Sciences) 2022** Paris, France
Creation: Sound waves in water
- **Laws of Nature Conference (Philosophy) 2022** Munich, Germany
Short talk: The role of ocean in the warming climate
- **FDSE Summer School 2022** Paris, France
Poster: Water mass subduction in the isopycnic coordinate
- **EUREC4A-OA Workshop 2022** Paris, France
Talk: Water mass subduction in the isopycnic coordinate
- **BGC-Argo Science Webinar (SOCCOM) 2022** virtually
Talk: Global mode water detection and its representation in heat transport
- **Ocean Sciences Meeting 2022** virtually
Talk: Global mode water detection and its representation in heat transport
- **TRIATLAS General Assembly 2021** virtually
Poster: Formation and transport of the South Atlantic subtropical mode water in eddy-permitting observations
- **LMD Webinar 2021: Mesoscale dynamics and air-sea interactions** virtually
Talk: The South Atlantic subtropical mode water in eddy-permitting observations
- **AGU Fall Meeting 2020** virtually
Talk: Effect of mesoscale eddies on mode water formation, transport and heat uptake in the world ocean
- **EGU General Assembly 2020** virtually
Talk: Effect of mesoscale eddies on subtropical mode water formation and ocean heat storage
- **EUREC4A Planning Workshop 2019** Paris, France
Talk: The effect of mesoscale eddies on air-sea interactions
- **EGU General Assembly 2019** Vienna, Austria
Talk: Flow-dependent Ekman theory and its application to shallow water models
- **McGill AOS Student Seminar 2018** Montreal, Canada
Talk: Flow-dependent Ekman theory
- **Ocean Mixing Gordon Research Conference 2018** Andover, USA
Poster: Flow-dependent Ekman theory

- **Seminar at Laboratoire de Météorologie Dynamique, École Normale Supérieure 2018** **Paris, France**
Talk: Flow-dependent Ekman theory
- **Ocean Sciences Meeting 2018** **Portland, USA**
Poster: A shallow water model forced by flow-dependent Ekman pumping
- **Ocean Mesoscale Eddy Interaction with the Atmosphere Workshop 2018** **Portland, USA**
Poster: The application of flow-dependent Ekman transport to a two-layer shallow water model
- **McGill AOS Student Seminar 2017** **Montreal, Canada**
Talk: Wind-driven Ekman transport of curvilinear flows
- **51st CMOS Congress 2017** **Toronto, Canada**
Poster: Frequency analysis of wind forcing over ocean gyres
- **University of Alberta Summer Poster Symposium 2015** **Edmonton, Canada**
Poster: Comparison of different ANHA simulations and analysis of time series for straits near Greenland

MISCELLANEOUS

- Versed in skills for numerical modeling, statistical analysis and visualizations (e.g., familiar with the Linux System, Fortran Language, Matlab, Python, Latex Editing, Photoshop etc).
- Other languages: mother tongue in Chinese Mandarin and basic everyday level of French.
- Journal reviews for: Journal of Climate, Journal of Physical Oceanography, Journal of Atmospheric and Oceanic Technology etc.