

Yanxu (Sue) Chen

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EDUCATION

- École Normale Supérieure (ENS)** **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.

RESEARCH EXPERIENCES

- Department of Physical Oceanography, Woods Hole Oceanographic Institution** **Woods Hole**
- Postdoc Investigator** Sep 2022 until now
- Supervised by Dr. Viviane Menezes and Dr. Lisan Yu
 - Research topics: air-sea interactions and stability.
- Project 1: The global imprint of ocean mesoscale dynamics on air-sea heat fluxes.
- Project 2: NASA's SASSIE campaign: Arctic air-sea heat budget and boundary layer stability in the Beaufort-Chukchi Seas.
- Project 3: Air-sea interactions in the Red Sea and Persian Gulf.
- Laboratoire de Météorologie Dynamique, École Normale Supérieure** **Paris**
- PhD Student** Dec 2018-Sep 2022
- Supervised by Prof. Sabrina Speich
 - Research topics: ocean mesoscale eddies, mode waters and ocean heat uptake.
- Project (thesis): Ocean ventilation at the mesoscale: co-location of satellite-detected mesoscale eddies and Argo-detected subsurface mode waters; water mass subduction in the isopycnic coordinate.
- EUREC4A campagne R/V L'Atalante** **south of Barbados**
- Scientific Crew Member** Jan-Feb 2020

Project: Deployments of several instruments, mainly CTD casts, uCTDs, XBTs and Argo floats; Water mass (mode water) detection with the proceeding shipborne data.

Department of Atmospheric and Oceanic Sciences, McGill University

Montreal

Master Student

Sep 2016-Dec 2018

- Supervised by Profs. David Straub and Louis-Philippe Nadeau
- Research topics: surface Ekman-layer dynamics, near-inertial waves, air-sea momentum budgets.
- Project 1: Impacts of synoptic winds on low-frequency wind stress, and influences of air stability on wind stress drag coefficient.
- Project 2 (thesis): Nonlinear Ekman theory, where an explicit slab Ekman layer is developed and applied as the momentum mediator between wind stress and interior ocean dynamics.

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 topics: estuarine dynamics of the interaction between river discharge and tides.
- Project 1: Hydrological dynamics of three main branches in the Pearl River Delta and the impacts of ENSO on the Pearl River floods.
- Project 2 (thesis): Responses of water levels to river discharge and tidal range in estuaries: combining an analytical 1D model with a statistical method of joint probability distribution.

Department of Earth and Atmospheric Sciences, University of Alberta

Edmonton

Summer Research Intern

May 2015-Sep 2015

- Supervised by Prof. Paul Myers
- Research topics: freshwater budget in the Arctic.
- Project: Freshwater fluxes through major straits around the Greenland: by comparing several numerical simulations to investigate the stratification and freshwater transport.

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 topics: turbulence at the bottom boundary layer.
- Project: Analysis of turbulence characteristics and their temporal-spatial variations (mainly the rate of turbulent kinetic energy dissipation) within the Pearl River Estuary bottom boundary layer.

PUBLICATIONS

- 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**
- Autumnal equinox shift in Arctic surface energy budget: Beaufort-Chukchi Seas case study (JGR Oceans, 2024). **Carrigg et al.**
- 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•** Physical phenology of air-sea heat budget for the Beaufort Sea autumn freeze-up. (under review) **Chen, Menezes and Yu**
- prep•** Impacts of atmospheric near-surface stability on the Arctic summer air-sea heat budget assessed with uncrewed surface vehicles. (under review) **Chen, Yu and Zhang**
- prep•** Role of mesoscale eddies in global mode water distribution and ventilation. (currently revising) **Chen and Speich**
- prep•** Water mass subduction in the isopycnic coordinate. **Chen, Straub and Speich**

TEACHING EXPERIENCES

- **Mentor for the Summer Student Fellow (WHOI)** **Summer 2024**
 SSF student: Sean Barnier from Embry-Riddle Aeronautical University
 Study on ocean's responses to tropical cyclones.
- **Mentor for the Summer Student Fellow (WHOI)** **Summer 2023**
 SSF student: Joe Carrigg from Oregon State University
 Study on air-sea heat budget in the Arctic Ocean.
- **One lecture in the course: Submesoscale Ocean Processes (WHOI)** **Fall 2022**
 Course instructor: Prof. Amala Mahadevan
- **TA in the course: Introduction to Oceanic Sciences (McGill)** **Winter 2018**
 Course instructor: Prof. Carolina Dufour
- **TA in the course: Natural Disasters (McGill)** **Fall 2017**
 Course instructors: Profs. John Gyakum and Souad Guernina
- **TA in the course: Pearl River Delta Field Trip (SYSU)** **Fall 2015**
 Field trip 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

FELLOWSHIPS AND AWARDS

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|-------------|---|-------------------|
| 2019 | Chaire Chanel Research Grant for the PhD study | 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	Education Bureau of China
2013	Sun Yat-sen University Scholarship for Outstanding Students	Sun Yat-sen University
	National Scholarship (only one student from the department)	Education Bureau of China

MISCELLANEOUS

- Journal reviews for: Geophysical Research Letters, Journal of Climate, Journal of Physical Oceanography, Journal of Atmospheric and Oceanic Technology, etc.
- 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.