Jinshi (Peter) Chen

121 Harriette Rd, Falmouth, MA, 02536
(607) 379-7985 • jinshic@mit.edu

EDUCATION

Cornell University, College of Arts & Sciences Ithaca, NY
Physics, Bachelor of Arts, Magna Cumma Laude May 2019
Overall GPA: 4.08 • Major GPA: 4.14

Woods Hole Oceanographic Institution, Physical Oceanography Cambridge & Woods Hole, MA
Massachusetts Institute of Technology, Earth, Atmosphere, and Planetary Science Jun. 2019-Present

RELATED COURSEWORK

Fluid Mechanics • Physical Oceanography • Coastal Oceanography • MATLAB • Spectral Method & Numerical Analysis • Dynamic Meteorology • Analytical Mechanics • Electricity and Magnetism • Waves • Mathematical Physics • Dynamical Systems and Chaos • Linear Algebra • Multivariable Calculus • Differential Equations

SPECIALIZED SKILLS

Computer: MATLAB • OpenFOAM • Dedalus • Python • FLUENT • LabVIEW
Laboratory: Acoustic Doppler Velocimetry (ADV) • Particle Image Velocimetry (PIV) • Laser Induced Fluorescence (LIF) • Image & data analysis • Raman spectroscopy • Analog & digital circuitry
Field Work: Aquadopp • CTD • Bottom sampling • IFCB

HONORS & AWARDS

• Merrill Presidential Scholar May. 2019
• American Physical Society Division of Fluid Dynamics 2018 student travel grant Sept. 2018
• Woods Hole Oceanographic Institution Summer Student Fellowship Jun. 2018-Aug. 2018
• National Marine Figure of the Year 2013 by State Oceanic Administration (SOA), P.R.China Jun. 2014

AFFILIATIONS

Phi Beta Kappa Honor Society (Mar. 2019-Present) • American Physical Society (Sept. 2018-Present)

RESEARCH GRANT AWARDED

• PADI Foundation Grant Apr. 2021

RESEARCH EXPERIENCE

MIT/WHOI Joint Program Cambridge, MA & Woods Hole, MA
Graduate Student Advisor: Dr. Glenn Flierl Dec. 2020-Present
• Simulate random vortex generation and advection over a slope using *Dedalus* framework.
• Derive dimensionless relation between vortex properties (energy, size, etc) and slope & bathymetry properties.
• Explore possible critical transitions of vortex advection using simplified vortex dipole advection model.

MIT/WHOI Joint Program Cambridge, MA & Woods Hole, MA
Graduate Student Advisor: Dr. Britt Raubenheimer & Dr. Steve Elgar Jun. 2019-Present
• Investigate the vertical structure of undertow with random waves and field-based bathymetry using *OpenFOAM*.
• Numerically investigate wave roller parametrization.
• Collect undertow data using Aquadopp during DUNEX 2021 field work.
• Compare the numerical result against Duck94 field data.
• Derive undertow parametrization based on model, field data, and theory on turbulence advection & diffusion.

Applied Ocean Physics & Engineering, Woods Hole Oceanographic Institution Woods Hole, MA
Summer Student Fellow Advisor: Dr. Britt Raubenheimer Jun. 2018-Aug. 2018
• Investigated the significance of wind effect and turbulent mixing on the setup and alongshore flows.
• Programmed surfzone setup and alongshore flow models.
• Compared modeled results with observations at Duck, NC, during the passage of Hurricane Matthew in 2016.
• Conducted CTD casts and bottom sampling at Martha's Vineyard, MA.

School of Civil & Environmental Engineering, Cornell University Ithaca, NY
Undergraduate Research Assistant Advisor: Professor Peter J. Diamessis May 2017-May 2018
• Numerically investigated nonlinear harmonic formation during the refraction of a Mode-1 internal tide.
• Built linear and nonlinear partial differential equation solvers using spectral and collocation methods.
• Explored the efficiency, accuracy, and stability of numerically solving nonlinear advection equations using fast Fourier transform, Runge-Kutta method and collocation method.
• Experimented on resolving the upwind between subdomains divided from one computational domain.

School of Civil & Environmental Engineering, Cornell University Ithaca, NY
Project Leader Advisor: Professor Edwin A. Cowen Mar. 2017-May 2017
• Collaboratively investigated the drag coefficient of a 2D NACA 0012 airfoil as a function of angle of attack.
• Collected fluorescent particle images using PIV and LIF.
• Implemented algorithms to analyze the collected images, calculated drag coefficient and checked the experimental result against previous works and FLUENT simulation results.

PRESENTATIONS

• Chen, J., Raubenheimer, B., & Elgar, S. (2018, November). *Surfzone Setup and Alongshore Currents During Hurricane Matthew.* Poster presented at 71st Annual Meeting of the APS Division of Fluid Dynamics.
• Chen, J., & Gallagher, S. (2016, August). *Raman Spectroscopy at two wavelengths (785nm and 532nm) for discriminating within and between Harmful Algal Bloom (HAB) species.* Poster presented at WHOI summer poster session.

MENTORING & TEACHING

Department of Physics, Cornell University Ithaca, NY
Peer Advisor Aug. 2017-Dec. 2017
• Mentored six incoming freshmen on physics course selections and finding research projects.

Department of Physics, Cornell University Ithaca, NY
Undergraduate Teaching Assistant Feb. 2016-May. 2016
• Held discussion sessions with a graduate teaching assistant for PHYS 1112: Mechanics & Heat. Answered questions and conducted discussion materials.

ADDITIONAL EXPERIENCE

• **Guest Student,** Woods Hole Oceanographic Institution, Woods Hole, MA Jul. 2016-Aug.2016
• **Leading Student Researcher on Cyanobacteria,** TsingHua University, Beijing, China Sept. 2013-Aug. 2014