

Kelly Yi-Chun Huang

yhuang28@nd.edu

+1 (832) 282 2226

Jul 2021	Ph.D.	Mechanical and Aerospace Engineering	Princeton University
Jan 2018	M.A.	Mechanical and Aerospace Engineering	Princeton University
Dec 2015	B.S.	Mechanical Engineering	Cornell University

Research

University of Notre Dame

- 2021 — present
- As postdoc working with Prof. Joe Fernando, I
- designed the Super Combo Probe that measures micro-scale velocity and temperature in the atmosphere, and
 - deployed various atmospheric sensing instrumentation in the FATIMA field campaign on Sable Island, Canada to shed light on the lifecycle of fog.

Princeton University

- 2016 — 2021
- Experimental Methods for Understanding Turbulence in the Lower Atmosphere*
- As graduate student working with Prof. Marcus Hultmark, I
- fabricated nano-scale velocity and temperature sensors in the clean room,
 - designed and deployed data acquisition platforms for nano-sensors in the Utah salt flats to study canonical turbulent boundary layer behavior,
 - analyzed near-surface atmospheric velocity and temperature data, and
 - designed a low-cost active grid for studying mosquito tracking behavior.

Cornell University

- 2015 — 2016
- As undergraduate research assistant with Prof. Charles Williamson, I designed, fabricated, and tested 3D-printed innovative blades for a mini vertical-axis wind turbine for urban settings.
- 2012 — 2014
- In AguaClara sustainable water treatment design, I built and analyzed a lab-scale rapid sand filter and an electric-free ram pump.
- 2014 — 2015
- As member of Cornell University Sustainable Design, we
- conducted a wind power feasibility study for the Cornell NYC campus,
 - formulated a proposal for local wind turbine implementation, and
 - constructed a functioning demonstrative wind turbine for outreach.

National Renewable Energy Laboratory

- Summer 2015
- As Science Undergraduate Laboratory Intern (SULI) to Dr. Katherine Dykes, I developed a Python toolbox coupled to OpenMDAO that optimizes the spar supporting structure of offshore wind turbines based on stability designs.

Honors and Awards

2020	Engineering Council's Excellence in Teaching Award	<i>Princeton</i>
2019	The Luigi Crocco Award for Teaching Excellence	<i>Princeton</i>
2017	National Defense Science and Engineering Graduate Fellowship	<i>DoD</i>
2016	Francis Robbins Upton Fellowship in Engineering	<i>Princeton</i>
2015	Undergraduate Student of the Year	<i>Cornell Diversity Programs in Engineering</i>

Teaching

Princeton University

2017 – 2021 As Graduate Coordinator for the McGraw Learning and Tutoring Center, I manage the undergraduate tutoring program by interviewing, staffing, training, and providing feedback for 140+ tutors.

As assistant in instruction, I held weekly precepts/lab sessions for

- Fall 2019 ■ MAE 305/MAT 391 – Mathematics in Engineering I
- Spring 2019 ■ MAE 222 – Introduction to Fluid Mechanics
- Spring 2018 ■ MAE 224 – Integrated Engineering Science Laboratory
- Fall 2017 ■ MAE 335 – Fluid Dynamics

Cornell University

As undergraduate teaching assistant, I held weekly recitations/lab sessions for

- Fall 2015 ■ MAE 3230 – Introduction to Fluid Mechanics
- Fall 2015 ■ MAE 6510 – Advanced Heat Transfer
- Spring 2015 ■ MAE 2250 – Mechanical Synthesis
- Fall 2014 ■ ENGRD 2020 – Statics and Mechanics of Solids

Student Thesis Supervision

- 2018 – 2019 Ramesh, Gayatri – B. S., Princeton University
Huang, Whitney – B. S., Princeton University
Controlling Unmanned Aerial Vehicles in High Wind Speeds Using Nano-Scale Thermal Anemometry Probes
- 2021 – present Hintz, Thomas J. – Ph. D., University of Notre Dame

Service

Princeton University

2016 – 2021

As part of MAE department educational outreach efforts, I

- undertook coursework on effective science pedagogy for children,
- developed workshops on engineering concepts, and
- led demos for K-8 children from Princeton and New York City.

2017 – 2020

As representative, then Chair, of the MAE Graduate Student Council, I

- organized graduate student events (i.e., open-house and alumni panels), and
- organized and hosted the annual MAE Research Day.

Referee/Reviewer

2021 - present

Experiments in Fluids

Publications

In Preparation

H.J.S. Fernando, S. Wang, K. Y. Huang, and E. Creegan, “Fog-laden density staircases in marine atmospheric boundary layer”, *Environmental Fluid Mechanics* (submitted).

K. Y. Huang, M. K. Fu, C. P. Byers, A. D. Bragg, and G. G. Katul, “Logarithmic scaling of higher-order temperature moments in the atmospheric surface layer”.

Peer-Reviewed Articles

K. Y. Huang, and G. G. Katul “Profiles of high-order moments of longitudinal velocity explained by the random sweeping decorrelation hypothesis”, *Physical Review Fluids* (2022).

K. Y. Huang, C. E. Brunner, M. K. Fu, K. Kokmanian, T. Morrison, A. O. Perelet, M. Calaf, E. Pardyjak, and M. Hultmark, “Investigation of the Atmospheric Surface Layer Using a Novel High-resolution Sensor Array”, *Experiments in Fluids* (2021).

K. Y. Huang, G. G. Katul, and M. Hultmark, “Velocity and Temperature Dissimilarity in the Surface Layer Uncovered by the Telegraph Approximation”, *Boundary-Layer Meteorology* (2021).

Peer-Reviewed Conference Proceedings

K. Y. Huang, M. K. Fu, C. P. Byers, A. D. Bragg, and G. G. Katul, “Logarithmic scaling of higher-order temperature moments in the atmospheric surface layer”, *12th Int. Symp. on Turbulence and Shear Flow Phenomena* Osaka, Japan (2022).

Invited Presentations

- | | |
|------|---|
| 2021 | University of Notre Dame — Environmental Fluid Dynamics Seminar
<i>Experimental Methods for Understanding Turbulence in the Lower Atmosphere.</i> |
| 2021 | University of California, Davis — Environmental Dynamics Lab Seminar
<i>Experimental Methods for Studying Turbulence in the Lower Atmosphere.</i> |
| 2020 | Cooper Union — Albert Nerken School of Engineering Invited Lecture
<i>From Mosquitos to Weather Models — Understanding Turbulence in the Lower Atmosphere.</i> |

Select Presentations

- | | |
|-----------------------|---|
| 2022 [Talk] | American Meteorological Society Annual Meeting
<i>The Super Combo Probe for simultaneous high-resolution measurement of velocity and temperature fluctuations in atmospheric turbulence.</i> |
| 2020 [Poster] | American Geophysical Union: Fall Meeting
<i>Velocity and Temperature Dissimilarity in the Surface Layer Uncovered by the Telegraph Approximation.</i> |
| 2018 [Poster] | American Geophysical Union: Fall Meeting
<i>Simultaneous and Well-resolved Velocity and Temperature Measurements in the Atmospheric Surface Layer.</i> |
| 2018 [Talk] | American Physical Society: Division of Fluid Dynamics
<i>Mimicking Atmospheric Flow Conditions to Examine Mosquito Orientation Behavior.</i> |
| 2015 [Pitch & Poster] | Cornell Atkinson Center: Creating a Sustainable Future
<i>Novel Blade Designs for Urban Mini-Turbines.</i> |