

## EDUCATION

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<b>University of Minnesota</b> Ph.D., Civil Engineering – Dissertation: “Large-eddy simulation of stably stratified atmospheric boundary layer turbulence: a scale-dependent dynamic modeling approach”	Minneapolis, MN, USA 2000–2004
<b>University of Windsor</b> Master of Applied Science, Environmental Engineering	Windsor, ON, Canada 1999–2000
<b>Indian Institute of Technology (IIT)</b> Bachelor of Technology (Honors), Civil Engineering	Kharagpur, WB, India 1994–1998

## PROFESSIONAL EXPERIENCE

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<b>University at Albany</b> Professor of Empire Innovation Atmospheric Sciences Research Center	Albany, NY, USA April, 2023 –
<b>University at Albany</b> Full Professor Department of Environmental and Sustainable Engineering	Albany, NY, USA April, 2023 –
<b>Delft University of Technology</b> Associate Professor (permanent position) Faculty of Civil Engineering and Geosciences	Delft, The Netherlands September, 2016–March, 2023
<b>North Carolina State University</b> Associate Professor (tenured in 2014) Department of Marine, Earth, and Atmospheric Sciences	Raleigh, NC, USA August, 2010–July, 2016
<b>Texas Tech University</b> Assistant Professor Atmospheric Science Group, Department of Geosciences Also at Wind Science and Engineering Research Center	Lubbock, TX, USA September, 2005–August, 2010
<b>University of Minnesota</b> Post-doctoral Research Associate St. Anthony Falls Laboratory	Minneapolis, MN, USA January–June, 2005

## ADJUNCT/VISITING POSITIONS

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### Università degli Studi di Cagliari

Visiting Professor

Dipartimento di Ingegneria Civile, Ambientale e Architettura

Cagliari, Italy

June 1–15, 2019

### North Carolina State University

Adjunct Associate Professor

Department of Marine, Earth, and Atmospheric Sciences

Raleigh, NC, USA

August, 2016–September, 2018

### Wageningen University

Visiting Scientist

Meteorology and Air Quality Group

Wageningen, The Netherlands

May–June, 2008

## RESEARCH INTERESTS

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Atmospheric boundary layer processes; atmospheric optics; machine learning; numerical weather prediction; renewable energy; and turbulence modeling.

## SELECTED ACCOMPLISHMENTS

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- Third place winner of the NASA Airathon: 2022  
<https://www.drivendata.org/competitions/91/competition-air-quality-no2/>
- First place winner of the Shell.ai Hackathon: 2021  
for sustainable and affordable energy; <https://www.shell.com/energy-and-innovation/digitalisation/digital-and-ai-competitions/shell-ai-hackathon-for-sustainable-and-affordable-energy.html>
- Best teacher awards @ TU-Delft: 2019  
Geoscience and Remote Sensing track (rank #1)  
Environmental Engineering track (rank #1)
- Best teacher awards @ TU-Delft: 2018  
Geoscience and Remote Sensing track (rank #1)  
Environmental Engineering track (rank #2)
- Elected member of the Boundary Layers and Turbulence Committee 2009  
American Meteorological Society
- Departmental nominee for the Chancellor’s Distinguished Research Award 2008  
Texas Tech University
- CAREER Award, National Science Foundation (USA) 2008
- Best Ph.D. dissertation in Civil Engineering 2005  
awarded by the Department of Civil Engineering, University of Minnesota
- NOAA Climate and Global Change postdoctoral fellowship 2005  
(declined in order to accept a faculty position at Texas Tech University)
- Doctoral dissertation fellowship 2003  
awarded by the Graduate School, University of Minnesota
- Sommerfeld fellowship 2000  
awarded by the Department of Civil Engineering, University of Minnesota
- Ontario graduate scholarship awarded by the selection board of 2000  
Ministry of Training, Colleges and Universities, Ontario, Canada  
(declined in order to accept the Sommerfeld fellowship at the University of Minnesota)

- Best final year project in Civil Engineering awarded by Indian Institute of Technology, Kharagpur, India 1998

## MACHINE LEARNING ACTIVITIES

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### Participation in Competitions

- *NASA Airathon: predict air quality (trace gas track)*  
Ranked 3<sup>rd</sup>, <https://www.drivendata.org/competitions/91/competition-air-quality-no2/> 2022
- *NASA Airathon: predict air quality (particular track)*  
Ranked 6<sup>th</sup>, <https://www.drivendata.org/competitions/88/competition-air-quality-pm//> 2022
- *Shell.ai Hackathon for sustainable and affordable energy: short-term forecasting of solar radiation*  
Ranked 1<sup>st</sup>, <https://www.shell.com/energy-and-innovation/digitalisation/digital-and-ai-competitions/shell-ai-hackathon-for-sustainable-and-affordable-energy.html> 2021
- *Day-ahead electricity demand forecasting: post-covid paradigm.*  
<https://dx.doi.org/10.21227/67vy-bs34> 2021
- *Drivendata competition on tropical storm intensity prediction*  
Ranked 32<sup>nd</sup> out of 733.  
<https://www.drivendata.org/competitions/72/predict-wind-speeds/leaderboard/> 2020
- *European Electricity Market (EEM) forecasting competition*  
Team leader, Ranked 3<sup>rd</sup>. 2020

### Online Courses

- *Coursera: Convolutional neural networks*  
<https://www.coursera.org/account/accomplishments/certificate/TKRW88JJDPU2> 2022
- *Coursera: Structuring machine learning projects*  
<https://www.coursera.org/account/accomplishments/certificate/9VZQC7U2DVZE> 2021
- *Coursera: Improving deep neural networks*  
<https://www.coursera.org/account/accomplishments/certificate/H6JWL762U88B> 2021
- *Coursera: Neural networks and deep learning*  
<https://www.coursera.org/account/accomplishments/certificate/HWQTB23HRWNH> 2021

## PROFESSIONAL ACTIVITIES

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### Associate Editor

- *Wind Energy Science* 2022–Present

### Editorial Board Memberships

- *Boundary-Layer Meteorology* 2023–Present
- *Wind Energy* 2019–Present
- *Environmental Fluid Mechanics* 2017–Present
- *Frontiers in Built Environment* 2016–Present
- *Atmosphere* 2020–2021

- *Energies* 2015–2021
- *The Open Atmospheric Science Journal* 2007–2017

### Guest Editing

- Special issue on “Recent Advances in Wind Power Meteorology”, *Energies* 2020–2021
- Special issue on “Large-Eddy Simulations (LES) of Atmospheric Boundary Layer Flows”, *Atmosphere* 2018

### Committees & Review Panels

- Member, NATO SET-304 group (Modelling, measuring, and mitigating optical turbulence) 2021–Present
- Founding member and coordinator of a new M.Sc. track Atmospheric Environment Engineering at TU-Delft 2020–2022
- Chair, Atmospheric Sciences Review Panel, Academy of Finland, Helsinki 2021
- Coordinator, met-ocean program line, GROW (<https://www.grow-offshorewind.nl/>) 2018–2020
- Member, NATO SET-ET-118 group (Modelling, measuring, and mitigating optical turbulence) 2019–2020
- Member, Atmospheric Sciences Review Panel, Academy of Finland, Helsinki 2019, 2020
- Contributing author of “The Netherlands’ Long-Term Offshore Wind R&D Agenda” (<https://www.topsectorenergie.nl/nieuws/netherlands-long-term-offshore-wind-rd-agenda>) 2019
- Member, Site Visit Panel for Strategic Partnership Grants, NSERC, Canada 2019
- Member, CAREER Panel, Energy for Sustainability Program, NSF, USA 2011
- Member, Wind/Wave Energy Panel, Energy for Sustainability Program, NSF, USA 2011
- Member, CAREER Panel on Biofuels and Wind Energy, Energy for Sustainability Program, NSF, USA 2010
- Member, Site Visit Panel Member, Wind Program Evaluation, Arizona Science Foundation, USA 2008
- Member, Committee Member, Lone Star Emmy Educational Foundation Harold Taft Scholarship, USA 2008

### Conference & Workshop Organization

- Member of the Organizing Committee, NCAR Summer Colloquium on the Atmospheric Boundary Layer, Boulder, CO, USA (<https://edec.ucar.edu/advanced-study-program/asp-colloquia>) 2023
- Theme Lead, Wind and Wind Farms, Torque 2022, Delft, the Netherlands (<https://www.torque2022.eu/>) 2022
- Program Chair, Propagation Through and Characterization of Atmospheric and Oceanic Phenomena, OSA 2019–2021

- Conference Committee Member, Laser Communication and Propagation through the Atmosphere and Oceans, SPIE 2015–2022
- Conference Committee Member, Environmental Effects on Light Propagation and Adaptive Systems, SPIE Remote Sensing 2019–2022
- Theme Lead, Wind and Wind Farms, Torque 2020, Delft, the Netherlands (http://torque2020.org/) 2020
- Scientific Organization Committee, workshop on ‘Non-Kolmogorov Turbulence and Associated Phenomena’, Fraunhofer IOSB, Ettlingen, Germany 2019
- Conference Committee Member, Propagation Through and Characterization of Atmospheric and Oceanic Phenomena, OSA, Orlando, FL, USA 2018
- Organizing Committee Member, Workshop on the Atmospheric Stable Boundary Layer, Delft, the Netherlands 2017
- Symposium Planning Committee Member, ‘Evapotranspiration: Challenges in Measurement and Modeling from Leaf to the Landscape Scale and Beyond’, Raleigh, NC, USA 2014
- Scientific Committee Member, 13th International Conference on Wind Engineering Amsterdam, The Netherlands 2011
- Co-convener of ‘Understanding of Land-Atmosphere Interactions with Models and Observations’, AGU Fall Meeting, San Francisco, CA, USA 2009
- Co-convener of ‘Wind Power Meteorology’, AGU Fall Meeting, San Francisco, CA, USA 2008–2010
- Co-convener of ‘Atmospheric Turbulence Scaling Mechanisms and their Meteorological Effects’, AGU Joint Assembly, Acapulco, Mexico 2008–2010

### Conference Session Chairs, Panel Members

- Panel Member, VAIBHAV Summit (<https://innovate.mygov.in/vaibhav-summit/>), Government of India 2020
- Session Chair, Propagation Through and Characterization of Atmospheric and Oceanic Phenomena, OSA 2020
- Session Chair, Propagation Through and Characterization of Atmospheric and Oceanic Phenomena, OSA, Munich, Germany 2019
- Session Chair, Propagation Through and Characterization of Atmospheric and Oceanic Phenomena, OSA, Orlando, FL, USA 2018
- Session Chair, American Meteorological Society (AMS) 21st Symposium on Boundary Layers and Turbulence, Salt Lake City, UT, USA 2016
- Session Chair, American Meteorological Society (AMS) 20th Symposium on Boundary Layers and Turbulence, Boston, MA, USA 2012
- Chair, Student Award Committee, American Meteorological Society (AMS) 19th Symposium on Boundary Layers and Turbulence, Keystone, CO, USA 2010
- Session Chair, “ABL and Turbulence Models for CWE II”, the Fifth International Symposium on Computational Wind Engineering, Chapel Hill, NC, USA 2010
- Discussion Panel Member, “Development, Validation, and Application of Atmospheric Boundary Layer Models and Turbulence Models for CWE”, the Fifth International Symposium on Computational Wind Engineering, Chapel Hill, NC, USA 2010

## Miscellaneous Activities

- Winner of the Offshore Wind Accelerator (OWA) wake modelling challenge 2019
- Chair of the 3rd GEWEX Atmospheric Boundary Layer Study (GABLS) Large-Eddy Simulation Intercomparison 2008–2010

## REVIEWING ACTIVITIES

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Please visit <https://publons.com/researcher/2777086/sukanta-basu/> for further information.

Papers reviewed for: Advances in Meteorology; ASME wind energy symposium; Applied Optics; Atmosphere; Boundary-Layer Meteorology; Energies; Environmental Fluid Mechanics; Environmental Research Letters; Euro Physics Letters; Geophysical Research Letters; Irrigation Science; Journal of Applied Meteorology and Climatology; Journal of Applied Physics; Journal of Applied Remote Sensing; Journal of Climate; Journal of Fluid Mechanics; Journal of Geophysical Research; Journal of the Atmospheric Sciences; Journal of Hydrometeorology; Journal of Renewable and Sustainable Energy; Journal of the Optical Society of America B; Journal of the Meteorological Society of Japan; Journal of Turbulence; Journal of Wind Engineering and Industrial Aerodynamics; Meteorology and Atmospheric Physics; Monthly Weather Review; Nonlinear Processes in Geophysics; Optics Express; Optics Letters; Physica D; Physics Letters A; Physics of Fluids; Quarterly Journal of Royal Meteorological Society; Tellus B; The European Physical Journal B; The Open Atmospheric Science Journal; Transactions of the ASABE; Water Resources Research; Weather and Forecasting; Wind Energy; Wind Energy Science.

Book chapters reviewed for: AMS monograph series (100 years of progress in Boundary-layer Meteorology).

Proposals reviewed for: National Science Foundation (USA); Academy of Finland; ETH Zurich, Switzerland; Natural Environment Research Council (UK); The Natural Sciences and Engineering Research Council of Canada; Arizona Science Foundation; Innovation and Technology Commission, The Government of Hong Kong; the Netherlands Organisation for Scientific Research (NWO); Technology Foundation STW, the Netherlands; Foundation for Fundamental Research on Matter (FOM), the Netherlands.

External PhD dissertation examiner: Civil Engineering, The University of Sydney, Australia; Department of Civil, Architectural, and Environmental Engineering, The University of Texas-Austin; School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore; Thermal and Fluid Engineering, Indian Institute of Technology–BHU.

External MSc thesis examiner: Technical University of Denmark (European Wind Energy masters program).

External course evaluator: Atmospheric Modelling course (MAQ 31806), Meteorology and Air Quality Group, Wageningen University, The Netherlands.

## SPONSORED RESEARCH

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- Funding Agency: Horizon 2020, European Green Deal 2021–2025  
Project Title: EUropean - Scalable and Complementary Offshore Renewable Energy Sources  
Lead organization: Dutch Marine Energy Centre (DMEC);  
co-PI from TU-Delft: George Lavidas and Sukanta Basu  
Funds: €448,000 (Basu's group); total: €34M

- Funding Agency: Dutch Research Council (NWO) 2021–2026  
 Project Title: Optical wireless super highways  
 Lead organization: TU-Delft;  
 PI: Eberhard Gill; co-PI: Sukanta Basu (one of several)  
 Funds: €250,000 (Basu’s group); total: €5.1M
- Funding Agency: TU Delft Institute for Computational Science and Engineering 2021–2023  
 Project Title: Reliable estimation of extreme wind gusts over the North Sea:  
 A convolutional neural network-based framework  
 PI: Sukanta Basu; co-PI: Simon Watson  
 Funds: €80,000
- Funding Agency: TKI, Wind op Zee, The Netherlands 2020–2022  
 Project Title: WINS50: Winds of the North Sea in 2050  
 Lead organization: Whiffle, BV; co-PI: Sukanta Basu and others  
 Funds: €462,869 (TU-Delft part)
- Funding Agency: CENER, Spain 2020  
 Project Title: Offshore wind accelerator: wake modelling challenge  
 PI: Sukanta Basu  
 Funds: €9,640
- Funding Agency: Sports Engineering Institute @ TU-Delft 2020  
 Project Title: Tokyo innovation funds: atmospheric modelling  
 in support of the Sail Ghost project  
 PI: Sukanta Basu, co-PI: Anoeck Van Vlaardingen  
 Funds: €25,000
- Funding Agency: Carbon Trust, UK 2017–2018  
 Project Title: Offshore wind accelerator: boundary layer profiling  
 PI: Sukanta Basu, co-PI: Simon Watson  
 Funds: £44,680
- Funding Agency: Sailing Innovation Center, The Netherlands 2017  
 Project Title: Sail ghost of Enoshima  
 PI: Sukanta Basu  
 Funds: €9,075
- Funding Agency: NSF (AGS-EAGER), USA 2016–2018  
 Project Title: Identifying the limitations of the contemporary planetary  
 boundary layer schemes using an extended self-similarity-based framework  
 PI: Sukanta Basu  
 Funds: \$63,189
- Funding Agency: NSF (CBET), USA 2013–2017  
 Project Title: A retrospective assessment and future projection of  
 thunderstorm impacts on the field performance of wind turbines  
 PI: Lance Manuel (University of Texas-Austin), co-PI: Sukanta Basu  
 Funds: \$199,810 (NCSU-part)
- Funding Agency: Department of Defense, USA 2012–2016  
 Project Title: Wave optics of deep atmospheric turbulence: from underlying  
 physics towards predictive modeling, mitigation and exploitation  
 PI: Mikhail Vorontsov (University of Dayton), co-PI: Sukanta Basu  
 Funds: \$500,000 (NCSU-part)

- Funding Agency: Renaissance Computing Institute (RENCI), USA 2011–2014  
Project Title: Micro-siting of wind turbines over complex terrains utilizing the OpenFOAM CFD toolbox and the WRF model  
PI: Sukanta Basu  
Funds: \$82,757
- Funding Agency: National Renewable Energy Lab, USA 2011–2012  
Project Title: Modeling the stable atmospheric boundary layer with computational fluid dynamics for wind energy application  
PI: Sukanta Basu  
Funds: \$4,272
- Funding Agency: NSF (CBET), USA 2010–2014  
Project Title: On turbine loads assessment for ultimate and fatigue limit states for different atmospheric boundary layer stability conditions  
PI: Lance Manuel (University of Texas-Austin), co-PI: Sukanta Basu  
Funds: \$123,140 (NCSU-part)
- Funding Agency: Department of Energy, USA 2010–2013  
Project Title: Enhancing short term wind energy forecasting for improved utility operations  
PI: Lead organization: AWS Truepower, co-PI: Sukanta Basu  
Funds: \$75,631 (NCSU-part)
- Funding Agency: NSF (CAREER award), USA 2008–2014  
Project Title: Towards better representation of the nocturnal low-level jets in new generation large-eddy and mesoscale models  
PI: Sukanta Basu  
Funds: \$505,060
- Funding Agency: Norman Hackerman Advanced Research, USA 2008–2010  
Project Title: Atmospheric stability considerations in design of wind turbines against fatigue  
PI: Lance Manuel (University of Texas-Austin), co-PI: Sukanta Basu  
Funds: \$51,776 (TTU-part)
- Funding Agency: NSF (Polar science program), USA 2006–2010  
Project Title: Understanding, parameterizing and modeling the strongly stratified atmospheric boundary layer processes over the Antarctic Plateau  
PI: Sukanta Basu  
Funds: \$173,000
- Funding Agency: Texas Advance Research Program, USA 2006–2009  
Project Title: Characterization and simulation of turbulence in stably stratified atmospheric boundary layers  
PI: Sukanta Basu, co-PI: Xiaoning Gilliam  
Funds: \$86,000
- Funding Agency: Texas Tech University, USA 2006–2009  
Project Title: Innovative technologies to investigate fine-scale atmospheric motions and their impact  
PI: John Schroeder, co-PI: Sukanta Basu and others  
Funds: \$1,000,000



## KEY COLLABORATORS

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Steve Fiorino (Air Force Institute of Technology, USA); Bert Holtslag (Wageningen University, The Netherlands); Lance Manuel (University of Texas at Austin, USA); Mikhail Vorontsov (University of Dayton, USA); Simon Watson (TU-Delft, The Netherlands).

## JOURNAL PUBLICATIONS

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Google Scholar Citations: <https://scholar.google.com/citations?user=08bv9p8AAAAJ&hl=en>

Researchgate Page: [http://www.researchgate.net/profile/Sukanta\\_Basu](http://www.researchgate.net/profile/Sukanta_Basu)

ORCID: 0000-0002-0507-5349

SCOPUS: 7403656752

ResearcherID: F-9286-2011

Graduate students and post-docs of my research group are indicated by \* and †, respectively.

- [69] Kartal†, S., **Basu, S.**, & Watson, S. J. (2023). A decision tree-based measure-correlate-predict approach for peak wind gust estimation from a global reanalysis dataset. *Wind Energy Science Discussions, preprint*.
- [68] **Basu, S.**, & Holtslag, A. A. M. (2022a). A novel approach for deriving the stable boundary layer height and eddy viscosity profiles from the Ekman equations. *Boundary-Layer Meteorology*, <https://doi.org/10.1007/s10546-022-00757-y>.
- [67] **Basu, S.**, & Holtslag, A. A. M. (2022b). Revisiting and revising Tatarskii's formulation for the temperature structure parameter ( $C_T^2$ ) in atmospheric flows. *Environmental Fluid Mechanics*, *22*, 1107–1119.
- [66] Li\*, B., **Basu, S.**, & Watson, S. J. (2022). Automated identification of "Dunkelflaute" events: A convolutional neural network-based autoencoder approach. *Artificial Intelligence for the Earth Systems, in press*.
- [65] Veers, P., Dykes, K., **Basu, S.**, Bianchini, A., Clifton, A., Green, P., Holttinen, H., Kitzing, L., Kosovic, B., Lundquist, J. K., Meyers, J., O'Malley, M., Shaw, W. J., & Straw, B. (2022). Grand challenges: Wind energy research needs for a global energy transition. *Wind Energy Science*, *7*, 2491–2496.
- [64] **Basu, S.**, DeMarco\*, A. W., & He†, P. (2021). On the dissipation rate of temperature fluctuations in stably stratified flows. *Environmental Fluid Mechanics*, *21*, 63–82.
- [63] **Basu, S.**, He†, P., & DeMarco\*, A. W. (2021). Parameterizing the energy dissipation rate in stably stratified flows. *Boundary-Layer Meteorology*, *178*, 167–184.
- [62] **Basu, S.**, & Holtslag, A. A. M. (2021). Turbulent Prandtl number and characteristic length scales in stably stratified flows: Steady-state analytical solutions. *Environmental Fluid Mechanics*, *21*, 1273–1302.
- [61] Cheneka\*, B. R., Watson, S. J., & **Basu, S.** (2021). Associating synoptic-scale weather patterns with aggregated offshore wind power production and ramps. *Energies*, *14*, 3903.
- [60] Li\*, B., **Basu, S.**, Watson, S. J., & Russchenberg, H. W. J. (2021a). A brief climatology of Dunkelflaute events over and surrounding the North and Baltic sea areas. *Energies*, *14*, 6508.
- [59] Li\*, B., **Basu, S.**, Watson, S. J., & Russchenberg, H. W. J. (2021b). Mesoscale modeling of a 'Dunkelflaute' event. *Wind Energy*, *24*, 5–23.
- [58] Lu, N.-Y., Manuel, L., Hawbecker\*, P. H., & **Basu, S.** (2021). A simulation study on risks to wind turbine arrays from thunderstorm downbursts in different atmospheric stability conditions. *Energies*, *14*, 5407.
- [57] Al-Younis, W., Nevarez, C., Abdullah-Al-Mamun, M., **Basu, S.**, & Voelz, D. (2020). Image shift due to atmospheric refraction: Prediction by numerical weather modeling and machine learning. *Optical Engineering*, *59*, 081803.

- [56] **Basu, S.**, Osborn, J., He<sup>†</sup>, P., & DeMarco\*, A. W. (2020). Mesoscale modelling of optical turbulence in the atmosphere: The need for ultrahigh vertical grid resolution. *Monthly Notices of the Royal Astronomical Society*, 497, 2302–2308.
- [55] Cheneka\*, B. R., Watson, S. J., & **Basu, S.** (2020). A simple methodology to detect and quantify wind power ramps. *Wind Energy Science*, 5, 1731–1741.
- [54] Couvreux, F., Bazile, E., et al. (2020). Intercomparison of large-eddy simulations of the Antarctic boundary layer for very stable stratification. *Boundary-Layer Meteorology*, 176, 369–400.
- [53] Dai\*, Y., **Basu, S.**, Maronga, B., & de Roode, S. (2020). Addressing the grid-size sensitivity issue in large-eddy simulations of stable boundary layers. *Boundary-Layer Meteorology*, 178, 63–89.
- [52] Durán, P., **Basu, S.**, Meißner, C., & Adaramola, M. S. (2020). Automated classification of simulated wind field patterns from multi-physics ensemble forecasts. *Wind Energy*, 23, 898–914.
- [51] **Basu, S.** (2019). A hybrid profile-gradient approach for the estimation of surface fluxes. *Boundary-Layer Meteorology*, 170, 29–44.
- [50] Lu, N.-Y., **Basu, S.**, & Manuel, L. (2019). On wind turbine loads during evening transition period. *Wind Energy*, 22, 1288–1309.
- [49] Lu, N.-Y., Hawbecker\*, P. H., **Basu, S.**, & Manuel, L. (2019). On wind turbine loads during thunderstorm downbursts in contrasting atmospheric stability regimes. *Energies*, 12, 2773.
- [48] **Basu, S.** (2018). A simple recipe for estimating atmospheric stability solely based on surface-layer wind speed profile. *Wind Energy*, 21, 937–941.
- [47] DeMarco\*, A. W., & **Basu, S.** (2018). On the tails of the wind ramp distributions. *Wind Energy*, 21, 892–905.
- [46] Hawbecker\*, P. H., **Basu, S.**, & Manuel, L. (2018). Investigating the impact of atmospheric stability on thunderstorm outflow winds and turbulence. *Wind Energy Science*, 3, 203–219.
- [45] **Basu, S.** (2017). Simulating an extreme over-the-horizon optical propagation event over lake Michigan using a coupled mesoscale modeling and ray tracing framework. *Optical Engineering*, 56, 071505.
- [44] **Basu, S.**, & Lacser, A. (2017). A cautionary note on the usage of Monin-Obukhov similarity theory in very high-resolution large-eddy simulations. *Boundary-Layer Meteorology*, 163, 351–355.
- [43] DeMarco\*, A. W., & **Basu, S.** (2017). Estimating higher-order structure functions from geophysical turbulence time-series: Confronting the curse of the limited sample size. *Physical Review E*, 95, 052114.
- [42] Hawbecker\*, P. H., **Basu, S.**, & Manuel, L. (2017). Realistic simulations of the July 1, 2011 severe wind event over the Buffalo Ridge wind farm. *Wind Energy*, 20, 1803–1822.
- [41] He<sup>†</sup>, P. H., & **Basu, S.** (2016). Extending a surface-layer  $C_n^2$  model for strongly stratified conditions utilizing a numerically generated turbulence dataset. *Optics Express*, 24, 9574–9582.
- [40] Wang\*, Y., & **Basu, S.** (2016a). Using an artificial neural network approach to estimate surface-layer optical turbulence at Mauna Loa, Hawaii. *Optics Letters*, 41, 2334–2337.
- [39] Wang\*, Y., & **Basu, S.** (2016b). Utilizing the Kantorovich metric for the validation of optical turbulence predictions. *Optics Letters*, 41, 4008–4011.
- [38] **Basu, S.** (2015). A simple approach for estimating the refractive index structure parameter ( $C_n^2$ ) profile in the atmosphere. *Optics Letters*, 40, 4130–4133.
- [37] He<sup>†</sup>, P. H., & **Basu, S.** (2015a). Development of similarity relationships for energy dissipation rate and temperature structure parameter in stably stratified flows: A direct numerical simulation approach. *Environmental Fluid Mechanics*, 16, 373–399.
- [36] He<sup>†</sup>, P. H., & **Basu, S.** (2015b). Direct numerical simulation of intermittent turbulence under stably stratified conditions. *Nonlinear Processes in Geophysics*, 22, 447–471.
- [35] He<sup>†</sup>, P. H., Nunalee\*, C. G., **Basu, S.**, Minet, J., Vorontsov, M. A., & Fiorino, S. T. (2015). Influence of heterogeneous refractivity on optical wave propagation in coastal environments. *Meteorology and Atmospheric Physics*, 127, 685–699.
- [34] Kiliyanpilakkil\*, V. P., & **Basu, S.** (2015). Extended self-similarity of atmospheric boundary layer wind fields in mesoscale regime: Is it real? *Europhysics Letters (EPL)*, 112, 64003.

- [33] Kiliyanpilakkil\*, V. P., **Basu, S.**, Ruiz-Columbié, A., Araya, G., Castillo, L., Hirth, B., & Burgett, W. (2015). Buoyancy effects on the scaling characteristics of atmospheric boundary layer wind fields in the mesoscale range. *Physical Review E*, *92*, 033005.
- [32] Nunalee\*, C. G., He†, P. H., **Basu, S.**, Minet, J., Vorontsov, M. A., & Fiorino, S. T. (2015). Mapping optical ray trajectories through island wake vortices. *Meteorology and Atmospheric Physics*, *127*, 355–368.
- [31] Nunalee\*, C. G., Horváth, A., & **Basu, S.** (2015). High resolution numerical modeling of mesoscale island wakes and sensitivity to static topographic relief data. *Geoscientific Model Development*, *8*, 2645–2653.
- [30] Park, J., Manuel, L., & **Basu, S.** (2015). Toward isolation of salient features in stable boundary layer wind fields that influence loads on wind turbines. *Energies*, *8*, 2977–3012.
- [29] Edwards, J. M., **Basu, S.**, Bosveld, F. C., & Holtslag, A. A. M. (2014). The impact of radiation on the GABLS3 large-eddy simulation through the night and during the morning transition. *Boundary-Layer Meteorology*, *152*, 189–211.
- [28] Nunalee\*, C. G., & **Basu, S.** (2014). On the periodicity of atmospheric von Kármán vortex streets. *Environmental Fluid Mechanics*, *14*, 1335–1355.
- [27] **Basu, S.**, Holtslag, A. A. M., Caporaso, L., Riccio, A., & Steeneveld, G.-J. (2013). Observational support for the stability dependence of the bulk Richardson number across the stable boundary layer. *Boundary-Layer Meteorology*, *150*, 515–523.
- [26] Holtslag, A. A. M., Svensson, G., Baas, P., **Basu, S.**, et al. (2013). Stable atmospheric boundary layers and diurnal cycles: Challenges for weather and climate models. *Bulletin of the American Meteorological Society*, *94*, 1691–1706.
- [25] Nunalee\*, C. G., & **Basu, S.** (2013). Mesoscale modeling of coastal low-level jets: Implications for offshore wind resource estimation. *Wind Energy*, *17*, 1199–1216.
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- [19] van de Wiel, B. J. H., **Basu, S.**, Moene, A. F., Jonker, H. J. J., Steeneveld, G.-J., & Holtslag, A. A. M. (2011). Comments on “an extremum solution of the Monin-Obukhov similarity equations”. *Journal of the Atmospheric Sciences*, *68*, 1405–1408.
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## BOOK CHAPTERS

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Graduate students and post-docs of my research group are indicated by \* and †, respectively.

- [2] Basu, S. (2022). Vertical wind speed profiles in atmospheric boundary layer flows, *Wind Energy Engineering*, 2nd Edition, edited by T. Letcher, Elsevier. ISBN: 9780323993531.
- [1] Basu, S. (2012). Turbulent flow modeling, *Handbook of Environmental Fluid Dynamics*, Volume Two, edited by H. J. S. Fernando, CRC Press/Taylor & Francis Group, LLC. ISBN: 978-1-4665-5601-0.

Graduate students and post-docs of my research group are indicated by \* and †, respectively.

- [15] Basu, S., Watson, S. J., Cheneka, B. R., and Lacoa Arends, E (2020). Day-ahead wind power predictions at regional scales: Post-processing operational weather forecasts with a hybrid neural network, 17th International Conference on the European Energy Market (EEM20), IEEE, doi: 10.1109/EEM49802.2020.9221979.
- [14] Lacoa Arends, E., Watson, S. J., Basu, S., and Cheneka, B. R. (2020). Probabilistic wind power forecasting combining deep learning architectures, 17th International Conference on the European Energy Market (EEM20), IEEE, doi: 10.1109/EEM49802.2020.9221929.
- [13] Li, B., Basu, S., Watson, S. J., and Russchenberg, H. W. J. (2020). Quantifying the predictability of a ‘Dunkelflaute’ event by utilizing a mesoscale model, Journal of Physics: Conference Series, 1618, 062042, doi: 10.1088/1742-6596/1618/6/062042.
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- [10] Basu, S., and He†, P. (2015). Estimating refractive index structure parameter ( $C_n^2$ ) profiles in the atmosphere: A wavelet transform-based approach, Proceedings of SPIE Optics & Photonics, doi: 10.1117/12.2188195.
- [9] He†, P. and Basu, S. (2015). Mesoscale modeling of optical turbulence ( $C_n^2$ ) utilizing a novel physically-based parameterizations, Proceedings of SPIE Optics & Photonics, doi: 10.1117/12.2188227.
- [8] Wang\*, Y., and Basu, S. (2014). Estimation of optical turbulence in the atmospheric surface layer from routine meteorological observations: An artificial neural network approach, Proceedings of SPIE Optics & Photonics, doi: 10.1117/12.2063168.
- [7] Nunalee\*, C. G., He†, P., Basu, S., Vorontsov, M. A., and Fiorino, S. T. (2014). Impact of large-scale atmospheric refractive structures on optical wave propagation, Proceedings of SPIE Optics & Photonics, doi: 10.1117/12.2063022.
- [6] He\*, P., Nunalee\*, C. G., Basu, S., Vorontsov, M. A., and Fiorino, S. T. (2014). Current status and challenges in optical turbulence simulations in various layers of the Earth’s atmosphere, Proceedings of SPIE Optics & Photonics, doi: 10.1117/12.2063023.
- [5] Basu, S., Nunalee\*, C. G., He\*, P., Fiorino, S. T., and Vorontsov, M. A. (2014). Reconstructing the prevailing meteorological and optical environment during the time of the Titanic disaster, Proceedings of SPIE Optics & Photonics, doi: 10.1117/12.2063195.
- [4] Nunalee\*, C. G., and Basu, S. (2014). Mesoscale modeling of low-level jets over the North Sea, Wind Energy: Proceedings of the Euromech Colloquium, edited by Michael Hölling, Joachim Pienke and Stefan Ivanell, Springer, pages: 197-202.
- [3] Basu, S., Holtslag, A. A. M., and Bosveld, F. C. (2011). GABLS3-LES intercomparison study, Workshop Proceedings – ECMWF Workshop on Diurnal Cycles and the Stable Boundary Layer, 7-10 November, Reading, UK, pages 75-82.
- [2] Holtslag, A. A. M., Svensson, G., Basu, S., Beare, R. J., Bosveld, F. C., and Cuxart, J. (2011). Overview of the GEWEX Atmospheric Boundary Layer Study (GABLS), Workshop Proceedings – ECMWF Workshop on Diurnal Cycles and the Stable Boundary Layer, 7-10 November, Reading, UK, pages 11-24.
- [1] Moene, A. F., Baas, P., Bosveld, F. and Basu, S. (2011). LES model intercomparisons for the stable atmospheric boundary layer, Quality and Reliability of Large-Eddy Simulations II, ERCOFTAC Series, Vol. 16, Salvetti, M. V., Geurts, B., Meyers, J., Sagaut, P. (Eds.), Springer.

## INVITED PRESENTATIONS

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Presenters are indicated by asterisks.

- [27] Basu, S. (2022). “Outer length scales in nocturnal stable boundary layers”, 11-15 July, Imaging & Applied Optics Congress, Vancouver, Canada.
- [26] Basu, S. (2022). “Optical turbulence modelling”, Keynote lecture, 7-10 June, International conference on Target and Background Modeling & Simulation, Bagnères-de-Bigorre, France.
- [25] Basu, S. (2019). “Wind energy developments in a changing climate: how can mesoscale modelling help?”, 23-25 July, School of Excellence, University of Messina, Italy.
- [24] Basu, S. (2019). “WRF modelling for wind energy applications”, 10-14 June, Università degli Studi di Cagliari, Italy.
- [23] Basu, S. (2019). “Mesoscale modeling of atmospheric flows for wind energy applications”, 6-10 May, von Kármán Institute for Fluid Dynamics, Belgium.
- [22] Basu, S. (2017). “Generating realistic inflow conditions for next-generation wind turbines”, 13 November, Wageningen University, the Netherlands.
- [21] Basu, S. (2017). “Idealized and realistic large-eddy simulations of optical turbulence ( $C_n^2$ )”, 26-29 June, Propagation through and Characterization of Atmospheric and Oceanic Phenomena (pcAOP), San Francisco, CA, USA.
- [20] Basu, S. (2017). “Multiscale modeling of atmospheric refraction and turbulence”, 1 June, Trends and Developments in Laser Based Dimensional Metrology, Lorentz Center, Leiden, The Netherlands.
- [19] Basu, S. (2017). “Mesoscale modeling of atmospheric flows for wind energy applications”, 28 March, von Kármán Institute for Fluid Dynamics, Belgium.
- [18] Basu, S. (2016). “On the scaling-based estimation of optical turbulence in the atmosphere”, 27-29 June, Propagation through and Characterization of Atmospheric and Oceanic Phenomena (pcAOP), Washington DC, USA.
- [17] Basu, S. (2016). “Quasi-universal scaling of boundary-layer wind speeds in mesoscale regime”, University of Oklahoma, Norman, OK, USA.
- [16] Basu\*, S., and He, P. (2015). “Extracting various similarity formulations from an extensive database of direct and large-eddy simulations of stably stratified flows”, 27 July, US National Congress on Computational Mechanics, San Diego, CA, USA.
- [15] Basu\*, S., and He, P. (2015). “Estimating optical turbulence in the atmosphere utilizing the inherent vertical scaling characteristics of temperature fields”, 7-11 June, Propagation through and Characterization of Distributed Volume Turbulence (pcDVT), Washington DC, USA.
- [14] Basu, S. (2015). “Mesoscale modeling of atmospheric flows for wind energy applications”, 25 February, von Kármán Institute for Fluid Dynamics, Belgium.
- [13] Basu, S. (2014). “Multiscale modeling of atmospheric refraction and turbulence”, 5 November, NATO ET-87 Study Group Meeting, University of Dayton, Dayton, OH, USA.
- [12] Basu\*, S., and He, P. (2014). “Quantifying the dependence of temperature and refractive index structure parameters on atmospheric stability using direct and large-eddy simulations”, 13-17 July, Propagation through and Characterization of Distributed Volume Turbulence (pcDVT), Seattle, WA, USA.
- [11] Basu, S. (2013). “Can the LES-Generated datasets complement field measurements?”, 20 November, Brazilian Micrometeorology Workshop, Santa Maria, Brazil.
- [10] Basu, S. (2013). “Addressing a few problems in stable boundary layer turbulence”, 10 April, Environmental Protection Agency, Raleigh, NC, USA.
- [9] Basu, S. (2013). “Mesoscale modeling of atmospheric flows for wind energy applications”, 13 March, von Kármán Institute for Fluid Dynamics, Belgium.
- [8] Basu, S. (2012). “Addressing a few problems in stable boundary layer turbulence”, 20 June, National Center for Atmospheric Research, Boulder, CO, USA.
- [7] Basu, S. (2011). “GABLS3 LES Intercomparison Study”, ECMWF/GABLS Workshop on Diurnal cycles



and the stable atmospheric boundary layer, 7-10 November, Reading, UK.

- [6] Basu, S. (2010). “Addressing a few emergent challenges in wind power meteorology”, Department of Mechanical Engineering and Engineering Science, University of North Carolina-Charlotte, NC, USA.
- [5] Basu, S. (2009). “Addressing a few emergent challenges in wind power meteorology”, Visher Lecture, Department of Geography, University of Indiana, Bloomington, IN, USA.
- [4] Basu\*, S., Ruiz-Columbié, A., and Harshan, S. (2008). “Deriving Monin-Obukhov similarity functions from dynamic large-eddy simulations”, American Geophysical Union Fall Meeting, 15-19 December, San Francisco, CA, USA.
- [3] Basu, S. (2007). “NEW LES intercomparison case.” Presentation at the GABLS Workshop, Stockholm, Sweden.
- [2] Basu, S. (2007). “Looking beyond dynamic Smagorinsky models for atmospheric boundary layer simulations.” Presentation at the Department of Atmospheric Sciences, University of Washington, Seattle, WA, USA.
- [1] Basu, S. (2004). “Understanding stably stratified atmospheric boundary-layer turbulence: integration of statistical and dynamical approaches with large-eddy simulations.” Presentation at the International Center for Theoretical Physics, 24 April, Trieste, Italy.

## TEACHING

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- **Delft University of Technology** 2016–Present
  - *CIE 4605: Atmospheric Turbulence (Quarter 3, 2017–2022)*
  - *CIE 4707: Air Quality (Quarter 3, 2017–2022)*
  - *AESB 2120: Signal Processing with MATLAB (Quarter 1, 2017–2018)*
  - *AESB 2121: Signals and Systems with PYTHON (Quarter 1, 2019–2022)*
  
- **North Carolina State University** 2010–2016
  - *MEA 455: Micrometeorology (Fall 2011, 2012, 2014)*
  - *MEA 463: Fluid Physics (Fall 2014)*
  - *MEA 510: Air Pollution Meteorology (Fall 2013, 2015)*
  - *MEA 593: Wind Power Meteorology (Spring 2012, 2014, 2016)*
  - *MEA 707: Planetary Boundary Layer (Spring 2011, 2013, 2015)*
  
- **Texas Tech University** 2005–2010
  - *ATMO 1300: Introduction to Atmospheric Science (Fall 2005–2008, Spring 2009)*
  - *ATMO 5301: Wind Power Meteorology (Spring 2009–2010)*
  - *ATMO 5301: Atmospheric Dispersion Modeling (Spring 2006, 2008)*
  - *ATMO 5319: Boundary-layer Meteorology (Fall 2007, 2009)*
  - *ATMO 5332: Regional-scale Numerical Weather prediction (Spring 2007)*

## RESEARCH GROUP

---

### Current Post-doctoral Research Associate

- Dr. Harish Baki

## Current Graduate Advisees

- Kevin Schuurman (M.Sc., TU-Delft)
- Maximilian Pierzyna (Ph.D., TU-Delft) – co-promoter: Sukanta Basu;  
co-promoter: Rudolf Saathof
- Bowen Li (Ph.D., TU-Delft) – co-promoter: Sukanta Basu;  
promoter: Herman Russchenberg
- Bedassa Cheneka (Ph.D., TU-Delft) – co-promoter: Sukanta Basu;  
promoter: Simon Watson

## Former Post-doctoral Research Associates

- Dr. Serkan Kartal (TU-Delft)  
Current position: Assistant Professor, Computer Engineering, Cukurova University, Adana, Turkey
- Dr. Ping He (NCSU)  
Current position: Assistant Professor, Department of Aerospace Engineering,  
Iowa State University, Ames, USA
- Dr. Arquímedes Ruiz Columbié (TTU)  
Current position: Lecturer, Texas Wind Energy Institute,  
Texas Tech University, Lubbock, USA

## Former Ph.D. Advisees

- Patrick Hawbecker (Atmospheric Science, NCSU) 2017  
Dissertation: The influence of ambient stability on downburst winds  
Current position: Senior Atmospheric Scientist, ArcVera Renewables  
Boulder, CO, USA
- Adam DeMarco (Atmospheric Science, NCSU; co-advisor: Russell Philbrick) 2017  
Dissertation: Multiscale characterization of the probability density functions  
of velocity and temperature increment fields  
Current position: Commander, 1st Combat Weather Squadron,  
Joint Base Lewis-McChord, USA
- Kiliyanpilakkil Velayudhan Praju (Atmospheric Science, NCSU) 2017  
Dissertation: Scaling characteristics of mesoscale wind fields in the lower  
atmospheric boundary layer: Implications for wind energy
- Aaron Sims (Atmospheric Science, NCSU; co-advised with Sethu Raman) 2016  
Dissertation: Investigation of the mesoscale interaction between the sea breeze  
circulation and the Sandhills convection  
Current position: Atmospheric Scientist, PEMDAS Technologies Innovations,  
Raleigh, NC, USA
- Yao Wang (Atmospheric Science, NCSU) 2016  
Dissertation: Estimating and forecasting optical turbulence in atmosphere  
using an artificial neural network approach  
Current position: Principal Fundamental Analyst, NextEra Energy, Inc.,  
West Palm Beach, FL, USA



- Chris Nunalee (Atmospheric Science, NCSU) 2015  
Dissertation: A dynamical characterization of atmospheric von Kármán vortex streets induced by bluff topography  
Current position: Director, Energy Resource Assessment and Optimization at NextEra Energy, Inc., West Palm Beach, FL, USA
- Brandon Storm (Ph.D.–IGERT Wind Science and Engineering Fellow, TTU) 2008  
Dissertation: Modeling of low-level jets over the Great Plains: Implications for Wind Energy  
Current position: Senior Meteorologist, Tradewind Energy, Inc., Lenexa, KS, USA

### Former M.S. Advisees

- Gijs van Ouwerkerk (TU-Delft) 2021  
Thesis: Novel machine learning methods for short-term solar PV forecasting
- Thom Homsma (TU-Delft; co-advisor) 2021  
Thesis: Multi-step ahead ultra-short-term wind power forecasting  
Current position: Renewable energy forecast analyst at Eneco Energy Trade B.V., the Netherlands
- Juliëtte Anema (TU-Delft; co-advisor) 2021  
Thesis: An automated approach to estimate carbon monoxide emissions from steel plants by utilizing TROPOMI satellite measurements  
Current position: Ph.D. student at KNMI, the Netherlands
- Eric Lacoa Arends (TU-Delft; co-advisor) 2021  
Thesis: Novel machine learning methods to enhance wind power probabilistic forecasting  
Current position: Business Translator D&A Middle Europe at Unilever, the Netherlands
- Camilla van Wirdum (TU-Delft; co-advisor) 2020  
Thesis: Extreme convective gusts in a future warmer climate assessed through a convection permitting model  
Current position: Junior Innovation Scientist, TNO, the Netherlands
- Haolin Liu (TU-Delft) 2020  
Thesis: Characterizing coastal wind speed gradients using Scanning LiDAR data and mesoscale modeling  
Current position: Ph.D. student at Hongkong University of Science and Technology
- Qidi Yu (TU-Delft) 2020  
Thesis: Mesoscale modelling of waterspouts: an offshore wind energy perspective  
Current position: Ph.D. student at University of Bergen, Norway
- Yi Dai (TU-Delft) 2020  
Thesis: Addressing the grid-size sensitivity issue in large-eddy simulations of stable boundary layers  
Current position: Ph.D. student at TU-Delft, the Netherlands
- Kars Trommel (TU-Delft) 2020  
Thesis: Wind classification using unsupervised learning: in support of the Olympic sailing competition in Tokyo, Japan  
Current position: Management Trainee, R&D Engineering, Philips, the Netherlands
- Pooja Ramakrishna (TU-Delft; co-advised with Pier Siebesma) 2019  
Thesis: Evaluation of a wind farm parameterization in an operational mesoscale model  
Current position: InSAR Consultant, SkyGeo, Delft, the Netherlands

- Adithya Vemuri (TU-Delft; co-advised with Simon Watson) 2019  
Thesis: A new coupled modelling framework for turbine inflow generation: mesoscale-synthetic turbulence  
Current position: PhD student at von Kármán Institute for Fluid Dynamics, Belgium
- Jori Dreef (TU-Delft) 2019  
Thesis: Simulating frontal low-level jets and quantifying their impact on wind energy production  
Current position: A Sustainable Energy Advisor at Pondera Consult B.V., the Netherlands
- Sam Koch (TU-Delft) 2018  
Thesis: Characterization of inflow wind fields using SpinnerLidar measurements during ScanFlow project  
Current position: Radar meteorologist at Buienradar, the Netherlands
- Jeffrey Craft (NCSU) 2013  
Thesis: Wind ramp events: Forecast verification and climatology  
Current position: Manager, Data Analytics at Clearway Energy Group, Phoenix, AZ, USA
- Yao Wang (NCSU) 2013  
Thesis: Generating realistic inflows for utility-scale wind turbines: A large-eddy simulation-based approach  
Current position: Sr. Solutions Project Lead at NextEra Energy, Inc., West Palm Beach, FL, USA
- Heather Richardson (NCSU) 2012  
Thesis: Improving stable boundary layer parameterization in a mesoscale model to better represent nocturnal low-level jets  
Current position: Sr. Operations Engineer at WindLogics, North Palm Beach, FL, USA
- Elizabeth Wilson (NCSU, non-thesis) 2012  
Current position: Director of Weather Programs at Synoptic Data PBC, Raleigh, NC, USA
- Suraj Harshan (TTU) 2009  
Thesis: Modeling of Antarctic boundary layer  
Current position: Senior Analyst, Swiss Re, India
- Rachel Rogers (TTU) 2008  
Thesis: Forecast verification: A dispersion modeling perspective  
Current position: Wind Research Analyst II at Alliant Energy, New York, NY, USA
- Julie Phillipson (TTU) 2008  
Thesis: Bursting events in the stable atmospheric boundary layer  
Current position: National Weather Service, Midland/Odessa, TX, USA
- William Anderson (TTU) 2007  
Thesis: A localized dynamic model for large-eddy simulation of the neutrally buoyant atmospheric boundary layer  
Current position: Associate professor, Department of Mechanical Engineering, University of Texas at Dallas, TX, USA

### **Former Visiting Researcher**

- Zihan Zhao (Ph.D. student, Harbin Institute of Technology Shenzhen, China; recipient of a CSC scholarship)
- Fabrizio Adamu (Erasmus Exchange Student from Università degli Studi di Cagliari, Italy)
- Dr. Wei Li

- Kornel Rozsavolgyi

## PROFESSIONAL AFFILIATIONS

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American Geophysical Union (AGU)  
 American Meteorological Society (AMS)  
 Directed Energy Professional Society  
 International Institute of Forecasters (IIF)  
 SPIE  
 The Optical Society (OSA)

## UNIVERSITY AND OUTREACH SERVICES

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- Lead coordinator, development of a new M.Sc. track on Atmospheric Environment Engineering, TU-Delft 2020–2022
- Collaboration with Sailing Innovation Centre, The Hague, The Netherlands (weather forecasting for the 2020 Olympics Games, Japan) 2018–2021
- Committee member, College of Science IT Director search, NCSU 2016
- Committee member, university-level academic misconduct committee, NCSU 2014–2015
- Committee member, college-level teaching awards committee, NCSU 2014–2015
- Science judge, Blue Heron Bowl, MEAS, NCSU 2013
- Presenter (via skype), South View Middle School, Hope Mills, NC 2012
- Presenter, Sigma-Xi 2012
- Presenter, General Electric, Greenville, SC 2012
- Interviewee, Radio In Vivo 2012
- Instructor, ‘Run on the Wind: Engineering a Clean Tomorrow’ summer camp, TTU 2011
- Organizer, ‘Run on the Wind: Engineering a Clean Tomorrow’ summer camp, TTU 2010
- Co-director, ‘Run on the Wind: Engineering a Clean Tomorrow’ summer camp, TTU 2009
- Chair, Numerical Weather Prediction search committee, Atmospheric Science Group, TTU 2008–2009
- Committee member, various departmental committees 2006–present