

# MAXIMILIAN PIERZYNA

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*Passionate about solving physical problems with data-driven methods.  
Currently developing machine learning models of atmospheric turbulence.*

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## EDUCATION

<b>Delft University of Technology</b> PhD Student, expected graduation 2026-08	2022-08 – ongoing Delft, The Netherlands
<b>Technical University of Braunschweig</b> Aerospace Engineering, Master of Science (with honours)	2019-10 – 2022-07 Braunschweig, Germany
<b>KTH Royal Institute of Technology</b> Aerospace Engineering, Erasmus+ Exchange	2020-08 – 2021-01 Stockholm, Sweden
<b>Technical University of Braunschweig</b> Mechanical Engineering, Bachelor of Science	2015-10 – 2019-09 Braunschweig, Germany

## PUBLICATIONS

- [5] M. Pierzyna, S. Basu, and R. Saathof, “OTClIM: Generating a near-surface climatology of optical turbulence strength ( $C_n^2$ ) using gradient boosting,” *Artificial Intelligence for the Earth Systems*, vol. 4, no. 2, 2025. DOI: 10.1175/AIES-D-24-0076.1.
- [4] M. Pierzyna, O. Hartogensis, S. Basu, and R. Saathof, “Intercomparison of flux, gradient, and variance-based optical turbulence ( $C_n^2$ ) parameterizations,” *Applied Optics*, vol. 63, no. 16, Jun. 2024. DOI: 10.1364/AO.519942.
- [3] M. Pierzyna, R. Saathof, and S. Basu, “II-ML: A dimensional analysis-based machine learning parameterization of optical turbulence in the atmospheric surface layer,” *Optics Letters*, vol. 48, no. 17, Sep. 2023. DOI: 10.1364/OL.492652.
- [2] M. Pierzyna, R. Saathof, and S. Basu, “A multi-physics ensemble modeling framework for reliable  $C_n^2$  estimation,” in *Proceedings of Environmental Effects on Light Propagation and Adaptive Systems VI*, vol. 12731, SPIE, Oct. 19, 2023, pp. 185–191. DOI: 10.1117/12.2680997.
- [1] M. Pierzyna, D. A. Burzynski, S. E. Bansmer, and R. Semaan, “Data-driven splashing threshold model for drop impact on dry smooth surfaces,” *Physics of Fluids*, vol. 33, no. 12, Dec. 2021. DOI: 10.1063/5.0076427.

## AWARDS AND HONOURS

<b>Best Student Paper Award</b> Optica Imaging Congress 2024	2024-07
<b>Highlighting of Pierzyna et al. [3] as “Editors’ pick”</b> Optica Publishing Group	2023-09
<b>Best Student Paper Award</b> SPIE Remote Sensing 2023 – Environmental Effects on Light Propagation and Adaptive Systems	2023-09

## MACHINE LEARNING COMPETITIONS

<b>Kelp Wanted: Segmenting Kelp Forests</b> Finished #38/671; resulting <i>KelpNet</i> presented at ESA/ECMWF ML4EOPS as poster	2024-02 DrivenData
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## RESEARCH VISITS

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<b>University at Albany</b> Visiting Scientist	2024-09 – 2024-11 Albany, NY, USA
<b>Fraunhofer Institute of Optronics, System Technologies, and Image Exploitation (IOSB)</b> Visiting Scientist	2024-01-10 – 12 Ettlingen, Germany
<b>National Center of Atmospheric Research (NCAR)</b> Participant, NCAR Advance Study Program, Summer Colloquium 2023	2023-07-17 – 28 Boulder, CO, USA

## PRESENTATIONS AND CONFERENCES

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- **AMS Boundary Layers and Turbulence Meeting**, Turin, Italy (poster) 2025-06  
(American Meteorological Society)  
*Extension of  $\Pi$ -ML (Pierzyna et al. [3]) to multiple years and larger heights*
- **Johns Hopkins University**, Baltimore, MD, USA (talk) 2024-10  
*Presented OTCLiM (Pierzyna et al. [5]) to groups of Julie Lundquist and Somdatta Goswami*
- **Airforce Institute of Technology**, Dayton, OH, USA (virtual talk) 2024-08  
*Presented OTCLiM (Pierzyna et al. [5])*
- **Optica Imaging Congress 2024**, Toulouse, France (talk) 2024-07  
*Presented OTCLiM (Pierzyna et al. [5])*
- **ESA/ECMWF ML4EOPS**, Frascati, Italy (poster) 2024-05  
(Machine Learning for Earth System Observation and Prediction)  
*KelpNet: Probabilistic Multi-Task Learning for Satellite-Based Kelp Forest Monitoring*
- **Dutch Meteorological Society, Annual Meeting**, Utrecht, The Netherlands (talk) 2023-11  
*Presented  $\Pi$ -ML (Pierzyna et al. [3])*
- **TMT International Observatory**, Pasadena, CA, USA (virtual talk) 2023-09  
*Presented  $\Pi$ -ML (Pierzyna et al. [3])*
- **SPIE Remote Sensing 2023**, Amsterdam, The Netherlands (talk) 2023-09  
*Presented Pierzyna et al. [2]*
- **COAT 2023**, Durham, UK (talk) 2023-03  
(Communications and Observations through Atmospheric Turbulence)  
*Parametrizing optical turbulence ( $C_n^2$ ) in the atmospheric surface layer with gradient boosting*

## REVIEWING ACTIVITIES

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Quarterly Journal of the Royal Meteorological Society, Journal of the European Meteorological Society, Optics Express

## VOLUNTARY WORK

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<b>Erasmus Student Network Germany</b> Various management positions within national and international teams	2021-03 – 2025-07 Germany
<b>L.G. Snellius (study association)</b> Board member	2023-04 – 2024-03 Delft, The Netherlands

## OTHER QUALIFICATIONS

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- Language skills: German (native), English (proficient, CEFR C2), Dutch (independent, CEFR B2)

- IT skills: Linux administration, networking, Python, PyTorch, Keras, Tensorflow, jax, git, L<sup>A</sup>T<sub>E</sub>X, handling large datasets (version controlled)
- Weather Research and Forecasting (WRF) modeling on HPC