MAXIMILIAN PIERZYNA

Rotterdam, The Netherlands
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Passionate about solving physical problems with data-driven methods.
Currently developing machine learning models of atmospheric turbulence.

EDUCATION

Delft University of Technology 2022-08 – ongoing
PhD Student, expected graduation 2026-08 Delft, The Netherlands

Technical University of Braunschweig 2019-10 – 2022-07
Aerospace Engineering, Master of Science (with honours) Braunschweig, Germany

KTH Royal Institute of Technology 2020-08 – 2021-01
Aerospace Engineering, Erasmus+ Exchange Stockholm, Sweden

Technical University of Braunschweig 2015-10 – 2019-09
Mechanical Engineering, Bachelor of Science 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, "Π-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

Best Student Poster Presentation (1st place) 2025-06
Boundary Layers and Turbulence meeting, American Meteorological Society

Best Student Paper Award 2024-07
Optica Imaging Congress 2024

Highlighting of Pierzyna et al. [3] as "Editors' pick" 2023-09
Optica Publishing Group

Best Student Paper Award 2023-09
SPIE Remote Sensing 2023 – Environmental Effects on Light Propagation and Adaptive Systems

MACHINE LEARNING COMPETITIONS

Kelp Wanted: Segmenting Kelp Forests 2024-02
Finished #38/671; resulting *KelpNet* presented at ESA/ECMWF ML4EOPS as poster DrivenData

RESEARCH VISITS

University at Albany 2024-09 – 2024-11
Visiting Scientist Albany, NY, USA

Fraunhofer Institute of Optronics, System Technologies, and Image Exploitation (IOSB) 2024-01-10 –12
Visiting Scientist Ettlingen, Germany

National Center of Atmospheric Research (NCAR) 2023-07-17 – 28
Participant, NCAR Advance Study Program, Summer Colloquium 2023 Boulder, CO, USA

PRESENTATIONS AND CONFERENCES

- **AMS Boundary Layers and Turbulence Meeting**, Turin, Italy (poster) 2025-06
  Extension of Π*-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 Π*-ML (Pierzyna et al. [3])*
- **TMT International Observatory**, Pasadena, CA, USA (virtual talk) 2023-09
  Presented Π*-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

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

VOLUNTARY WORK

Erasmus Student Network Germany 2021-03 – 2025-07
Various management positions within national and international teams Germany

L.G. Snellius (study association) 2023-04 – 2024-03
Board member Delft, The Netherlands

OTHER QUALIFICATIONS

- Language skills: German (native), English (proficient, CEFR C2), Dutch (independent, CEFR B2)
- IT skills: Linux administration, networking, Python, PyTorch, Keras, Tensorflow, jax, git, LaTeX, handling large datasets (version controlled)
- Weather Research and Forecasting (WRF) modeling on HPC