NICOLAS DOEPKE – CURRICULUM VITAE

Ludwig-Maximilians-Universität München (LMU)
Department of Earth and Environmental Sciences
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EDUCATION

Geophysics, Bachelor of Science (LMU) | *2020-2024*
Thesis: „*Understanding differences in Earth's ionospheric cold ion outflow using machine learning*"

Geophysics, Master's Programme (LMU) | *2024-Present*
Specialized on space plasma physics and data-driven analysis of solar–terrestrial interactions

RESEARCH EXPERIENCE

Research Assistant at LMU Space Weather Group | *2024-Present*

PUBLICATIONS

Doepke, N. „*Predictive analytics of cold ion outflow from the Earth's ionosphere", Frontiers in Astronomy and Space Sciences, Section: Space Physics,* Vol. 12, 2025, https://doi.org/10.3389/fspas.2025.1646575

SCHOLARSHIPS

Deutschlandstipendium Geophysik (Germany Scholarship) | *2026*
LMU Munich | Münchener Universitätsgesellschaft e.V.

PROJECTS

Modelling Traced Cold Ion Outflow in the Topside Ionosphere | *2025-Present*
Using traced Cluster-measured magnetotail cold ions back to the topside ionosphere
Development of machine learning models to study polar cap ionospheric outflow dynamics

Upstream Proton Environment Analysis for ESA Athena Mission | *2025-Present*
Conducted statistical and spectral analysis of upstream proton intensities at L1
Development proton flux and spectral index models to assess the space weather environment

Modelling Cold Ion Outflow in the Magnetotail | 2024-*2025*
Process cold ion observations in the magnetotail using data obtained with the wakefield method
Developed both interpretable linear and complex non-linear machine learning models

INVITED TALKS

Sun Yat-Sen University (Zhuhai, China) | *2025*
Topic: Modelling cold ion outflow in the magnetotail using machine learning

SKILLS AND RESEARCH INTERESTS

Programming: Python (NumPy, Pandas, SciPy, Matplotlib, Scikit-learn)
Machine Learning: Supervised learning for space physics data
Scientific Computing: Time series analysis, statistical modelling, data visualization
Domains: Space weather, ionospheric outflow, magnetospheric coupling, L1 upstream proton environment