

Julius Störk

DOCTORAL RESEARCHER · LITHIUM-ION ELECTRODE MANUFACTURING

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PROFILE

Electrochemist working where machine learning meets battery electrode manufacturing. Industrial doctoral researcher (Dr.-Ing.) with VARTA Microbattery and TU Braunschweig, combining electrode process development with process–property modelling. Earlier work spans cathode materials, electrochemical characterisation, and laboratory automation. Particular interest in continual learning: how models absorb new process regimes without discarding what they already know.

PROFESSIONAL EXPERIENCE

Electrode Engineer, Lithium-Ion Battery Prototyping Sep 2025 – present

VARTA Microbattery GmbH · Ellwangen, Germany · Industrial doctorate with TU Braunschweig (iPAT)

- Develop and qualify electrode processing routes — coating and calendaring — for the CoinPower lithium-ion button-cell range (9.4–16.1 mm diameter, 29–145 mAh).
- Scaled a semi-dry electrode production route to 3 kg/h across several active-material chemistries.
- Built a calendaring-aware thermal-conductivity closure that cut prediction error across 27 calendaring states from 31.1% to 4.5% mean absolute percentage error, correcting the monotonic assumption behind porosity-only models.

Strategic Corporate Development Aug 2021 – Mar 2022

Jobvalley GmbH · Hamburg, Germany

- Produced the market, competitor, and market-entry analyses behind the company's expansion into the Netherlands, which launched as pilot projects.

Research Assistant Dec 2020 – Apr 2021

Max Planck Institute for Solid State Research, with BASF · Stuttgart, Germany

- Established viable precursor routes for NCA and NMC cathode active material, and showed that eutectic lithium-source mixtures lower the calcination temperature of the lithiation step.

Data Analyst, Team Lead Aug 2019 – Dec 2020

Eurofins Genomics · Munich, Germany

- Led a 12-person data-analysis team for qPCR assay quality control, coordinating between laboratory operations and customers.
- Built out testing facilities and analysis workflows during the group's COVID-19 RT-PCR scale-up.

RESEARCH INTERSHIPS

Institute of Catalysis Research · Prof. Roland Fischer Jan – Mar 2024

Technical University of Munich

- Synthesised porphyrin-based Zr-MOFs metalated with Ru, paired with imidazolium ionic liquids of varying alkyl chain length, establishing a viable route to the catalyst pair.
- Screened the pair for sequential catalysis — epoxidation followed by CO₂ fixation within a single framework — in a programme transferring concepts from enzymatic catalysis to synthetic MOFs.

Chair of Physical Chemistry · Prof. Ulrich Heiz Sep – Dec 2023

Technical University of Munich

- Commissioned a CD-REMPI setup, making two measurements possible on chiral species from laser ablation: enantiomeric excess, and circular dichroism resolved through single vibronic transitions of the intermediate electronic state.

Process Development, Solid Oxide Fuel Cells Sep – Dec 2022

Robert Bosch GmbH · Bamberg, Germany

- Scaled ceramic paste processing from laboratory batches to mass-production volumes, characterising the rheology that governs coating quality.

Technical University of Munich

- Helped develop an operando OEMS setup and ran the degradation quantification for the group's study of proton intercalation in Ni-rich NCM, introduced by ashing and by improper handling or storage.
- The measurements established a 200 mV first-charge diffusion overpotential at only 2 mol% intercalated protons, even at C/50, and tracked the electrochemical deintercalation of those protons above 4.5 V vs Li.

E D U C A T I O N**Dr.-Ing. Candidate, Mechanical Engineering**

Sep 2025 – present

TU Braunschweig • Institute for Particle Technology (iPAT), Particle Simulation & Functional Structures

- Supervisor: Prof. Dr.-Ing. Carsten Schilde. Industrial doctorate in cooperation with VARTA Microbattery GmbH.
- Machine learning for lithium-ion electrode manufacturing: process-property modelling of calendered electrodes, and continual learning under process drift.
- Derived a replay-free, Fisher-free continual-learning controller (IGFA) that reduces forgetting by 36% against naive continual fine-tuning of a 410M-parameter language model while improving adaptation ($p \leq 0.024$, three seeds), carrying only a low-rank subspace as state.

Continuing Education — Machine Learning

Sep 2024 – Sep 2025

Technical University of Munich • enrolled student

- Graduate coursework in Machine Learning and Data Science, alongside independent projects, undertaken before beginning doctoral research.
- Google × Kaggle 5-Day AI Agents Intensive.

M.Sc. Chemistry

Apr 2022 – Sep 2024

Technical University of Munich (TUM) • Focus: electrochemistry and materials science

- Thesis: built an automated scanning droplet cell with accompanying data models, enabling systematic high-throughput electrochemical screening of Prussian blue analogues.

B.Sc. Chemistry and Biochemistry

Sep 2017 – Jul 2021

Ludwig Maximilian University of Munich (LMU) • Final grade 1.3 (German scale, 1.0 best)

- Thesis: screened a series of lithium sources and quantified how each shapes the calcination of NCA cathodes.

M A N U S C R I P T S I N P R E P A R A T I O N

- Störk, J. Interference and retention in continual learning: forgetting as weight-interference energy, and a replay-free structural controller (IGFA).
- Störk, J. Capturing the calendering U-shape in lithium-ion electrode thermal conductivity: a calendering-aware Zehner–Bauer–Schlunder closure.

Drafts and interactive figures at j-stoerk.github.io

S K I L L S**Analytical**

XRD, SEM, TGA, XPS, FTIR, GC/MS; impedance spectroscopy, galvanostatic cycling, and online electrochemical mass spectrometry (OEMS).

Computational

Python (pandas, NumPy, SciPy), MATLAB, SQL; machine learning, with emphasis on continual-learning methods.

Engineering

CAD (SolidWorks, AutoCAD); laboratory automation and instrument control.

Languages

German (native), English (C2), Spanish (A2).

V O L U N T E E R I N G & I N T E R E S T S**Homework Supervision • Mittagsbetreuung Kafka-Grundschule, Munich**

Sep 2024 – Sep 2025

Jazz saxophone. • Bouldering and climbing.