

Luca Mondonico

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WORK & RESEARCH EXPERIENCE

Tesla, Inc.

Cell Engineer Intern

Palo Alto, CA, US

Mar. 2023 – July 2023

- Led 3 internal cell qualification programs, coordinating 100+ testing protocols with multiple labs and external vendors.
- Developed an internal tool used by 50+ employees, resulting in a 90% reduction of cell qualification test planning/validation time.

Materials Engineer Intern

Feb. 2022 – Dec. 2022

- Developed and tested potting materials for battery packs of Model 3, Y, Cybertruck, and Semi. The prototype materials led to a 3kg mass reduction per car, and \$5.2 million saved in materials procurement per quarter.
- Saved up to 500 hours of active test monitoring by designing novel faster testing protocols to evaluate battery materials mechanical compliance in temperature-sensitive scenarios, such as cells thermal runaways and supercharging.

Stanford University

Research Scholar – Zhenan Bao Group at Stanford ChemE

Stanford, CA, US

July 2021 – Feb. 2022

- Pioneered a solution-processable artificial solid electrolyte interphase for effective anode protection in Li-metal batteries.
- Collaborated on designing and synthesizing fluorinated electrolyte solvents for improved cyclability in Li-ion batteries.

ETH Zürich

Research Fellow & Teaching Assistant

Zürich, CH

Sep. 2019 – June 2021

- Pioneered nanostructured carbon–gold composite battery electrodes for applications in wearable electronic devices. The transparent battery can be stretched up to 50% without losing the electrochemical stability over 120 cycles.
- Provided one-on-one instruction for about 25 students in a graduate-level course on transport phenomena.

Nanyang Technological University

Research Intern

Singapore, SG

July 2018 – Sep. 2018

- Spearheaded a team of 3 international researchers to the implementation of an experimental model for carbon monoxide adsorption on miniature gas detectors, ultimately reaching a 30% increase in the devices sensitivity.
- Promoted low-cost scalability of 2+ miniaturized biomimetic sensors for ultra-fast detection of disease biomarkers.

EXPO 2017 Astana

Student Representative at the Italian Pavilion

Nur-Sultan, KZ

June 2017 – Aug. 2017

- Presented to 20 local organizers a weekly program of 2-hour conferences on the importance of introducing sustainable energy technologies in underdeveloped countries.

EDUCATION

Stanford University

Ph.D. candidate in Materials Science and Engineering; Minor in Computer Science

Stanford, CA, US

Sep. 2023 – Present

- **2024 Chevron Fellowship in Energy**

ETH Zürich

MSc in Materials Science, with distinction

Zürich, CH

Sep. 2019 – July 2023

- MSP Scholarship recipient (granted a \$13,000 yearly stipend, 50 scholarships for ~ 5000 students).
- D-MATL Departmental Fellowship (granted a \$2,000 quarterly stipend, 1 fellowship for ~ 60 students).

Politecnico di Milano

BSc in Materials and Nanotechnology Engineering – 110/110 cum laude

Milan, IT

July 2016 – July 2019

SELECTED PUBLICATIONS

- Mondonico, Luca, et al. "Hierarchical Moiety-Aware Graph Transformer for Li-metal Electrolyte Formulation Design", *Nature Energy* (under revision); *ChemRxiv preprint*, 2025
Developed HELENA, a novel graph transformer that encodes moiety-level chemistry using hierarchical attention mechanisms, achieving >99.7% Coulombic efficiency in experimentally validated predictions.

EXTRA-CURRICULAR ACHIEVEMENTS

Volleyball – Team Captain – Italian National Champion.

2013, 2015

SKILLS

Technical: Python (PyTorch, PyTorch Geometric), GNNs, Molecular representation learning, Generative molecular design, SQL.

Languages: Italian (Native), English (Proficient).