

# Luca Mondonico

512 O'Keefe St, Menlo Park CA 94025 | +1 (650) 507-9027 | lu.mondonico@gmail.com

## EDUCATION

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### Stanford University

Stanford, CA, US

*Graduate Visiting Student — Zhenan Bao Group at Stanford ChemE*

*July 2021 – Present*

- Main research: "Molecular variations for Li-metal batteries and their impact on Li-metal battery operations".
- Investigating dynamic, electrolyte-blocking, and ion-conductive networks for stable Li-metal anodes.

### ETH Zürich

Zürich, CH

*MSc in Materials Science — GPA: 5.8/6*

*Sep. 2019 – Jan. 2022*

- Master Scholarship Program 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).
- Interests: Energy storage and conversion, Material's lifecycle and reliability, Metallic glasses, Multiferroics.

### Politecnico di Milano

Milan, IT

*BSc in Materials and Nanotechnology Engineering — 110/110 cum laude*

*July 2016 – July 2019*

- Relevant courses: Materials technology and processing, Polymers, Metallurgy, Nanostructuring techniques.

## RESEARCH & WORK EXPERIENCE

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### ETH Zürich

Zürich, CH

*Research Fellow*

*Sep. 2019 – Present*

- 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.
- Initiated the development of a theoretical framework for the analysis of cross-coupling effects in viscoelastic interfaces subject to electromagnetic fields for lightweight design of electronics-related composites.

*Teaching Assistant*

- Provided one-on-one instruction for about 25 students in a graduate-level course on transport phenomena.

### Nanyang Technological University

Singapore, SG

*Research Intern — Full-time*

*July 2018 - Sep. 2018*

- Spearheaded a team of 2 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.
- Generated actionable insights to promote low-cost scalability of 2+ miniaturized piezoelectric biomimetic sensors for ultra-fast detection of disease biomarkers.

### EXPO 2017 Astana – International Exposition

Astana, KZ

*Student Representative at the Italian Pavilion — Full-time*

*July 2017 - Aug. 2017*

- Presented to 20 local organizers a weekly program of 2-hour conferences on sustainable energy technologies in underdeveloped countries. As a result, the pavilion visitors' satisfaction rate grew from 75% to 82%.

### Politecnico di Milano

Milan, IT

*Student Researcher*

*Sep. 2016 - Aug. 2019*

- Collaborated with a team of 4 in investigating novel polymer blends to be used for industrial mechanical joints. The 6-month project resulted in a prototype which was delivered to a \$80m Italian power engineering company.

## PROJECTS

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**Battery manufacturing:** Gold-nanowire/carbon-nanotube current collector for stretchable thin-film Li-ion batteries.

**Transport phenomena:** Cross-coupling effects for viscoelastic interfaces in the presence of electromagnetic fields.

**Sensor:** Luminescent paper-based carbon-nanotube/polythiophene chemiresistive sensor for toxic gases analysis.

**Case study:** Life Cycle Assessment and Material Flow analysis of commercial lighting equipment.

**Advanced sustainability economics:** Analytical solution for the economic social optimum in the Basic Climate and Pollution Economy (BCE) model, with reflections on the role of population growth in global sustainable development.

## EXTRA-CURRICULAR ACHIEVEMENTS

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**High School Chemistry Workshop — Founder & Lecturer**

2016

- Organised 10+ hands-on experiments for the students, gathering a combined 100+ attendees.
- Petitioned my old school for financial support, generating ~\$1200 of funds.

**Volleyball — Team Captain — 2013 Italian National Champion U17**

## SKILLS

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**IT:** SolidWorks, Python, OriginPro, MATLAB, L<sup>A</sup>T<sub>E</sub>X.

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

**Technical:** SEM, TEM, AFM, FTIR and Raman spectroscopy.