

Curriculum Vitae - Lucas LAPOSTOLLE

Personal Information

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Work experience

2023-present **Postdoctoral researcher at SIMlab, NTNU - Trondheim, Norway**

Work on the mechanical modeling of Lithium ion batteries for electric vehicles: impact behavior and swelling mechanism.

2019 - 2022 **PhD in mechanical modeling - PIMM/ENSAM - Paris, France**

Title: Numerical study of the influence of microstructural heterogeneity on the residual stresses induced by laser shock peening.

Supervising team: Olivier Castelnau (lead supervisor), Léo Morin (associate supervisor), Katell Derrien (associate supervisor).

Content: simulations of stress wave and residual stresses using macroscopic and polycrystal models incorporating crystal plasticity aspects; simulation and homogenization of stress waves in a laminate material.

Simulations performed using ABAQUS and a Python code developed for the PhD.

March 2019 - **Internship - AKKA TECHNOLOGIES - Cannes, France**

October 2019 Content: improving the Finite Elements modeling process for aerospace components made by additive manufacturing; work on satellite structures from Thales Alenia Space.

July 2017 - August **Internship - Triumph Controls France - Villeneuve-le-roi, France**

2017 Optimization of workshop organization, work in assembly line.

Education

2016 - 2019 **ENSTA Bretagne - Brest, France - French engineering school**

Double diploma: French Engineering diploma (Master's degree); Master's degree in mechanical engineering, materials and civil engineering.

Training in mechanical modeling (metals, composites, elastomers), Finite Elements simulations (static and dynamic loads), fatigue behavior, continuum mechanics.

February 2018 - July **Politecnico di Milano - Milan, Italy**

2018 Erasmus semester in Aeronautical engineering master.

Training in Finite Elements simulations, aeronautical dynamics, numerical simulations applied to fluid mechanics.

Publications

2022 Lapostolle, L., K. Derrien, L. Morin, L. Berthe, and O. Castelnau. 2022. "Fast numerical estimation of residual stresses induced by laser shock peening". Under review at European Journal of Mechanics

2022 Lapostolle, L., K. Derrien, L. Morin, L. Berthe, and O. Castelnau. 2022. "Modeling and Simulation of Laser Shock Waves in Elasto-Plastic 1D Layered Specimens." International Journal of Solids and Structures 239–240 (March): 111422. <https://doi.org/10.1016/j.ijsolstr.2022.111422>.

2022 Ayad, M., L. Lapostolle, A. Rondepierre, C. Le Bras, M. Scius-Bertrand, S. Ünalı, U. Trdan, et al. 2022. "Modeling of Multi-Edge Effects in the Case of Laser Shock Loadings Applied on Thin Foils: Application for Material Characterization of Aluminum Alloys." Journal of Applied Physics 131 (9): 095902. <https://doi.org/10.1063/5.0080326>.

2022 Ayad, M., Lapostolle, L., Rondepierre, A., Bras, C.L., Ünalı, S., Donik, C., Klobčar, D., Berthe, L., Trdan, U., New methodology of dynamical material response of dissimilar FSWed Al alloy joint under high strain rate laser shock loading, Materials & Design (2022), doi: <https://doi.org/10.1016/j.matdes.2022.111080>.

Conferences with talks

August 2022 Congrès Français de Mécanique (French Mechanical Congress) - Nantes, France

July 2022 11th European Solid Mechanics Conference (ESMC) - Galway, Ireland

April 2022 18th European Mechanics of Materials Conference (EMMC) - Oxford, UK

April 2021 Plasticité 2021 - online

Extracurricular activities

- February 2023 French qualification for the position of **Associate Professor**
- October 2020 - **Teaching activities - CNAM - Paris, France**
- November 2021 Numerical methods (100 hours) - supervised exercises for classes of 10 students - use of Matlab.
- January 2021- Elected representative of the PhD students at the laboratory council of the PIMM laboratory.
- November 2022
- November 2017 Member of the organizing team of the ENSTA Bretagne's annual gala.

Skills

- Languages** French: native speaker.
English: advanced oral/written comprehension/expression, ability to understand and write scientific articles, to speak publicly.
German: beginner, limited oral/written comprehension/expression.
Italian: basic notions.
- Software/ Programming** Finite Elements simulations: ABAQUS, NASTRAN, FEMAP.
CAO: CATIA v5.
Programming: Python, Matlab.
Text editor: Latex, Word, PowerPoint.

Centers of interest

- Sports** Sport and rock climbing, indoors and outdoors.
Hiking, trekking.
Swimming.
- Books** Recreational reading (science-fiction).

References

- Dr Olivier CASTELNAU
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- Dr Laurent BERTHE
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- Dr Véronique FAVIER
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