

# Carlo Zanoni

*Experienced Mechanical and Systems Engineer* with a solid track record developing space and science hardware valued at over 150M EUR.

## Skills

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**Software:** Ansys, Matlab, Maxwell/HFSS, COMSOL, Inventor, SolidWorks, Nastran

**Management tools:** MS Project, Planner, JIRA, JAMA, Doors

**Standards:** ECSS, ISO, EN

**Languages:** Italian (Native), English (C1), French (B1), German (A2)

## Experience

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**Senior Engineer,** INFN - National Institute for Nuclear Physics – Trento, IT Dec 2021 – Present

- Project Engineer for the Gravitational Reference System (GRS, 100M+ EUR) of ESA's LISA space mission.
- Manage GRS development and implementation with regular meetings and tasks coordination ensuring project momentum. Guided the project to a successful Preliminary Design Review (2025).
- Lead in-house thermo-mechanical, electromagnetic and optical analyses ensuring a detailed performance understanding. Mentor young team members.
- Supervise critical in-house test activities and prepare procurements (< 500k EUR) for test hardware.
- Review the VIRGO infrastructure systems engineering and management for upgrade approval.

**Opto-mechanical Engineer,** ESO – Munich, DE Jan 2018 – Nov 2021

- Technical Officer for Extremely Large Telescope systems (several 10M+ EUR contracts) and astronomical instruments, responsible for opto-mechanical performance, structural, and thermal engineering.
- Ensured compliance to ESO specifications, interfaces and safety standards of designs, manufactured components and tests, with constant follow-up of industry and science consortia and frequent on-site visits.
- Solved development and interface problems with FEM models, analytical methods and CAD concepts.
- Identified design issues and acknowledged progresses as board member of 20+ gate reviews.

**Mechanical Engineer (Fellow),** CERN – Geneva, CH Nov 2014 – Oct 2017

- Mechanical Engineer in the superconducting RF Crab Cavities team, HL-LHC upgrade.
- Coordinated development, implementation and commissioning activities for the LHC-ready prototype successfully installed and tested in SPS.
- Ensured design safety and performance coordinating mechanical, thermal, and electromagnetic analyses.
- Prepared and awarded RF Crab Cavities series ITT and contract (> 2 MCHF) and several small manufacturing orders (< 50 kCHF).
- Guided trade-off studies for the magnets of the Hollow Electron Lens.

**R&D Engineer (PhD Candidate),** UniTrento – Trento, IT Aug 2011 – Oct 2014

- Tested and analyzed the release mechanism of the LPF space mission and its risk of cold-welding.
- Designed components for the Drag-free Cubesat and SNAPS sat.
- Teach-assisted Mechanical Vibrations and Mechanical Systems courses with excellent students' feedback.

## Education

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**University of Trento** – PhD in Mechanical Systems Engineering 2011 – 2015

**University of Trento** – Master's in Mechatronics Engineering, 110/110 cum laude 2008 – 2011

**Stanford University** – Spacecraft Design Course 2012

## Other Activities

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Spacecraft Engineer — Stanford University (USA)	2012 fall semester
Payload Engineer Trainee — Airbus (DE)	08/2010 – 02/2011
Volunteer, italian lessons to asylum seekers — centro Astalli	2023 – present
Volunteer — Cooperativa EDERA (social enterprise for sustainable food)	2022 – present
Volunteer — italian scout association AGESCI	2004 – 2014

## Recognitions

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National scientific qualification (Italy, ASN) as **associate professor** for the field of "Aeronautical and aerospace engineering and naval architecture" – 2025 to 2037

ESA ‘**Space Systems Engineer**’ roster – Included in 2024 selection

ITER ‘**Systems Engineer**’ roster – Included in 2024 selection

## Selected Talks

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**Measuring the Invisible** – Fraunhofer Italia, Apr 2025

**Development Plan of the Upgraded Release Mechanism for LISA** – AMS Conference, May 2024

**Mechanical Engineering for Optical Instruments** – ORP Instrumentation School, 2023

**The LISA Space Mission** – CERN, 2022

## Publications

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More than 20 full journal papers, h-index 14 (scopus)

- Dalla Ricca, E., Zanoni, C. and Redaelli, E.M.A., Oct. 2024. “Accounting for material property uncertainty in the preliminary vibration analysis of opto-mechanical systems”. *Journal of Astronomical Telescopes, Instruments, and Systems*, 10(4), 044002.
- Vignotto, D., Zanoni, C. et al. Dec. 2023. “The Role of Friction in the LISA-Pathfinder Release Mechanism Anomaly”. *AIAA Journal* 61:12, 5232-5241.
- Calaga, R. et al. June 2021. “First demonstration of the use of crab cavities on hadron beams”. *Phys. Rev. Accel. Beams* 24, p. 062001. doi: 10.1103/PhysRevAccelBeams.24.062001.

**Full list available on** [Google Scholar](#).