



Luca Mazzotta

Nationality: Italian | **Email address:** luca.mazzotta@uniroma1.it

● ABOUT ME

Luca Mazzotta is an Energy and Combustion Engineer and a PhD Research Student at the Department of Astronautical, Electrical and Energy Engineering at Sapienza University of Rome. He obtained a M.Sc. in Energy Engineering at the same University. He was a visiting researcher at Cardiff University in 2023. His research focuses on hydrogen and ammonia combustion on gas turbine burners in collaboration with Baker Hughes, while supporting several EU funded projects. He specialises in Computational Fluid Dynamics (CFD), analysing NOx formation and combustion dynamics, to optimise thermal performance, emissions, and efficiency.

● EDUCATION AND TRAINING

01/01/2022 – CURRENT Rome, Italy

DOCTOR OF PHILOSOPHY - PHD CANDIDATE - ENGINEERING Sapienza University of Rome - Baker Hughes

- Feasibility study of hydrogen-ammonia mixtures combustion in industrial gas turbines.
- Impact of hydrogen-ammonia flames on NOx emissions.
- Flame stabilization.
- Combustion Dynamics and Thermoacoustic Instability.

Address Via Eudossiana, 18, 00184, Rome, Italy | **Field of study** Combustion of Alternative Fuels | **Level in EQF** EQF level 8

01/08/2023 – 31/12/2023 Cardiff, United Kingdom

DOCTOR OF PHILOSOPHY - PHD CANDIDATE - ENGINEERING Cardiff University / Prifysgol Caerdydd

- Experimental investigations of premixed, diffusive and cracked ammonia/hydrogen flames.
- Impact of hydrogen-ammonia blends on NOx emissions.
- CFD analysis.
- Chemiluminescence analysis.
- Flame stabilization.
- Thermoacoustic Instability.
- Combustion diagnostics.

Field of study Combustion | **Level in EQF** EQF level 8

01/09/2019 – 01/07/2021 Rome, Italy

MASTER OF SCIENCE: ENERGY ENGINEERING Sapienza University of Rome

- In-depth knowledge of all major renewable technologies
- Highly complex planning and development activities with multidisciplinary technical skill involving economic-organizational and management aspects are carried out
- Control and management of different mechanical, electric and thermal system of plants powered by renewable energy sources, fossil and nuclear fuel

Address Via Eudossiana, 18, 00184, Rome, Italy | **Field of study** Energy Engineering | **Final grade** 110/110 |

Level in EQF EQF level 7 |

Thesis Numerical study of hydrogen/air combustion and thermal performance in a swirling non-premixed annular micro-combustor

01/09/2014 – 01/03/2019 Rome, Italy

BACHELOR OF SCIENCE - ENERGY ENGINEERING Sapienza University of Rome

Address Via Eudossiana, 18, 00184, Rome, Italy | **Field of study** Energy Engineering | **Level in EQF** EQF level 6 |

Thesis Energy analysis of the technologies of the MAAT project (Multibody Advanced Airship for transport)

● WORK EXPERIENCE

01/01/2022 – CURRENT Florence, Italy

AEROTHERMAL COMBUSTION ENGINEER BAKER HUGHES

- Reactive CFD analysis of industrial burners.
- Feasibility study of hydrogen-ammonia mixtures combustion in industrial gas turbines.
- Impact of hydrogen-ammonia flames on NOx emissions.
- Flame stabilization.
- Combustion Dynamics.

Address Via Felice Matteucci, 2, Florence, Italy

03/04/2023 – 31/07/2023 Rome, Italy

INTERNSHIP SUPERVISOR SAPIENZA UNIVERSITY OF ROME - POLYTECH CLERMONT

- Subject of internship: Turbulence model comparison for high-hydrogen content mixture combustion in a swirled combustor.
- Provided guidance and supervision to a student during their internship program.
- Monitored the student's progress, provided feedback, and evaluated their performance.

01/09/2019 – 31/08/2022 Rome, Italy

ELECTRIC SYSTEM OFFICER FAST CHARGE - SAPIENZA UNIVERSITY OF ROME

- Designed, built, tested and raced single seat Formula SAE race car internationally
- Designed battery pack and BMS of the car with 18650 cells technology
- Developed Ansys vehicle thermal and electric simulation tools to aid vehicle design
- Developed car wiring and harness using Zuken and EasyEDA electric circuit software

Business or Sector Professional, scientific and technical activities

01/01/2018 – 31/07/2018 Rome, Italy

INTERN ENEL GREEN POWER

● CONFERENCES AND SEMINARS

22/09/2024 – 27/09/2024 Shanghai, China

3rd Symposium on Ammonia Energy

21/07/2024 – 26/07/2024 Milan, Italy

40th Combustion Institute Symposium

24/06/2024 – 28/06/2024 London, UK

ASME Turbo Expo 2024

02/06/2024 – 06/06/2024 Bari, Italy

ASICI - 46th Meeting of the Italian Section of the Combustion Institute

11/09/2023 – 15/09/2023 Rome, Italy

10th Symposium on Turbulence, Heat and Mass Transfer

11/07/2023 – 13/07/2023 Orleans, France

2nd Symposium on Ammonia Energy

26/06/2023 – 30/06/2023 Boston, Massachusetts, USA.

ASME Turbo Expo 2023

28/05/2023 – 31/05/2023 Florence, Italy

ASICI - 45th Meeting of the Italian Section of the Combustion Institute

31/08/2022 – 02/09/2022 Cardiff, United Kingdom

1st Symposium on Ammonia Energy

27/06/2022 – 01/07/2022 Florence, Italy

Advanced Research in Turbomachinery (ART)

12/06/2022 – 17/06/2022 Rotterdam

ASME Turbo Expo 2022

● **VOLUNTEERING**

01/10/2023 – 24/06/2024 London, UK.

ASME Turbo Expo 2024 - Session Chair and Organiser

Session Chair and Organiser in "*Coal, Biomass, Hydrogen and Alternative Fuels*" Committee

● **PUBLICATIONS**

2024

On the effect of kinetic model on NO_x emissions in premixed NH₃-CH₄ turbulent flames using LES-CRN methodology

Mazzotta L. et al, Proceedings of the 3rd Symposium on Ammonia Energy

2024

Large Eddy Simulations For The Prediction Of Fuel-Bound NO_x Emissions: Application To NH₃ And NH₃-CH₄ Blends At Different Operating Conditions

Mazzotta L. et al, ASME Turbo Expo, London, 2024.

2024

Assessing the potential of chemiluminescence-based sensors for premixed ammonia- hydrogen-air turbulent flames

Mazzotta L. et al, submitted to Combustion and Flame, 2024.

2024

On the impact of CFD turbulence models for premixed NH₃/H₂ combustion on emissions and flame characteristics in a swirl-stabilized burner

Mazzotta et al., in peer review process Flow, Turbulence and Combustion, 2024.

2024

Numerical Investigation in a Gas Turbine Burner Operating with Hydrogen-Ammonia Blend using Large Eddy Simulation and LES-CRN Methodology

Mazzotta et al., Proceedings of 46th Italian Section of the Combustion Institute, 2024.

2024

Effects of Reynolds Number and Ammonia Fraction on Combustion Characteristics of Premixed Ammonia-Hydrogen-Air Swirling Flames

Sato D., Mazzotta L. et al., Proceedings of the Combustion Institute, 2024.

2024

Ammonia blends for gas-turbines: preliminary test and CFD-CRN modelling

Romano C., Mazzotta L. et al., Proceedings of the Combustion Institute, 2024.

2024

Experimental and numerical investigation of NH₃/H₂/N₂ Combustion in a premixed/stratified swirl burner.

Davies J., Mazzotta L. et al., Journal of Gas Turbine and Power, 2024.

2024

Analysis of the NO_x formation pathways in a partially premixed burner operated with pure hydrogen

Meloni R., Mazzotta L. et al., Proceedings of 46th Italian Sections of Combustion Institute, 2024

2024

Emissions Analyses of Humidified 20% (vol.) Cracked Ammonia Swirling Flows

Davies J., Mazzotta L. et al., submitted to Combustion and Flame, 2024.

2023

Modelling Ammonia-Hydrogen-Air Combustion and Emission Characteristics of a Generic Swirl Burner

Mazzotta L. et al., Journal of Gas Turbines and Power, 2023.

2023

A comparative study of different turbulence models for premixed NH₃/H₂ combustion in a swirl-stabilized burner

Mazzotta L. et al, Proceedings of Turbulence, Heat and Mass Transfer, 2023.

2023

Cavitation assessment on a model scale tidal turbine

Evangelisti A, Mazzotta L. et al, Proceedings of Turbulence, Heat and Mass Transfer, 2023.

2022

Analysis of the NO_x emissions deriving from hydrogen/air combustion in a swirling non-premixed annular micro-combustor

Mazzotta L. et al., Proceeding of ASME Turbo Expo, Rotterdam, NL, paper no. GT2022-81131, 2022.

● **LANGUAGE SKILLS**

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● **DIGITAL SKILLS**

ANSYS workbench, ANSYS fluent | ANSYS Chemkin | COSMOL Multiphysics 5.0 | Matlab and Matlab Simulink | AutoCAD | Rhinoceros Modellazione 3D | Zuken E3 | Microsoft Word | LaTeX | Microsoft Office | Outlook | linguaggi di programmazione Python | Microsoft Excel