

# Francesco Ambrogi - Curriculum Vitae

## Education

2019-2023 **Queen's University** Ph.D. Mechanical Engineering

**Thesis title:** *Characterization of unsteady flow separation in a turbulent boundary layer via Large-Eddy Simulation.*

2016-2019 **University of Bologna** M.S. Energy and Nuclear Engineering

**Thesis title:** *Tritium Transport and In-Core Absorption in the Fluoride-salt-cooled High-temperature Reactor (FHR).*

2012-2015 **University of Modena** B.S. Mechanical Engineering

**Thesis title:** *Identification, analysis and experimental validation of predictive models to calculate injection molding machine's energy consumption.*

## Published Journal Articles

1. Ambrogi F., Piomelli U., and Rival D. E. "**Characterization of unsteady separation in a turbulent boundary layer: mean and phase-averaged flow.**" *Journal of Fluid Mechanics* 945 (2022): A10.
2. Ambrogi F., Piomelli U., and Rival D. E. "**Characterization of unsteady separation in a turbulent boundary layer: Reynolds stresses and flow dynamics.**" *Journal of Fluid Mechanics* 972 (2023): A36
3. MacDougall C. Y., Piomelli U., and Ambrogi F. "**Evaluation of turbulence models in unsteady separation.**" *Fluids* 8(10) (2023).

## Conferences and other publications

- Ambrogi F., Piomelli U., and Rival D. E. **Influence of time-varying freestream conditions on unsteady separation in a turbulent boundary layer** 76th American Physical Society (APS) Division of Fluid Dynamics, Washington DC - 2023
- Ambrogi F., Piomelli U., and Rival D. E. **Advection dynamics of a turbulent separation bubble** The 14th International ERCOFTAC

Symposium on Engineering Turbulence Modelling and Measurements, Barcelona (Spain) - 2023

- Ambrogi F., Piomelli U., and Rival D. E. **Frequency dependence of unsteady separation in a turbulent boundary layer** 75th American Physical Society (APS) Division of Fluid Dynamics, Indianapolis (Indiana) - 2022.
- MacDougall C.Y., Piomelli U., and Ambrogi F. **Performance of Reynolds Averaged Navier Stokes Models for Unsteady Separated flows** 75th American Physical Society (APS) Division of Fluid Dynamics, Indianapolis (Indiana) - 2022.
- Ambrogi F., Piomelli U., and Rival D. E. **Large-Eddy simulation of a turbulent boundary layer with unsteady pressure gradients** Twelfth International Symposium on Turbulence and Shear Flow Phenomena (TSFP12), Osaka - 2022.
- Ambrogi F., Piomelli U., and Rival D. E. **Dynamics of turbulent kinetic energy advection in a turbulent boundary layer under unsteady pressure gradients** 13th Direct and Large Eddy Simulation, Udine, (Italy) - 2022.
- Ambrogi F., Hantsis Z., Rival D. E., and Piomelli U. **Large-Eddy simulation of a boundary layer with unsteady pressure gradient** 74th American Physical Society (APS) Division of Fluid Dynamics, Phoenix (AZ) - 2021.

## Work Experience

2024-present **University of Waterloo** Research Assistant

- ARC4CFD: course co-developer of Advanced Research Computing for Computational Fluid Dynamics, a 16-hours long, open-source, asynchronous course on how to leverage high performance computing resources for computational fluid dynamics.

2023-present **Royal Military College of Canada** Adjunct assistant professor

- MEE 311 (Fluid Mechanics I): primary instructor and course developer
- MEE 315 (Fluid Dynamics): primary instructor and course developer
- MEE 313 (Fluid Mechanics II): primary instructor and course developer

2022-present **Queen's University** Teaching Fellow

- MECH 241 Winter 2024 (Fluid Mechanics I): primary instructor and course developer.
- MECH 241 Winter 2023 (Fluid Mechanics I): primary instructor and course developer.

2019-2022 **Queen's University** Teaching Assistant

- MECH 241 (Fluid Mechanics I): lead teaching assistant (fall and winter term)
- MECH 341 (Fluid Mechanics II): lead teaching assistant and assistant instructor
- MECH 398 (Mechanical Engineering Lab): lead teaching assistant (air-flow in pipes module)

2020-2022 **Queen's University** Lead teaching assistant

- Interdisciplinary engineering for sustainability and innovation. This is a winter term 4 credit course in which I acted as a lead teaching assistant to a cohort composed of 5 fellow teaching assistants, and 25 students.
- How to Change the World booth camp. This is a one-week long workshop organized across the world, in which I acted as lead teaching assistant.

## Honors and awards

2023-2024 **Queen's University Silver Wrench Award**: Presented on an annual basis, this award recognizes the professor who displays the most interest and enthusiasm towards Mechanical Engineering as chosen by the graduating year.

2022-2023 **Queen's University Silver Wrench Award**

2022-2023 **Rotary International Rotaract Leadership Award**

2021-2022 **Queen's University Bronze Wrench Award**: Presented on an annual basis, this award recognizes the teaching assistant who displays the most interest and enthusiasm towards Mechanical Engineering as chosen by the graduating year.

2021-2022 **Queen's University Dean's Teaching Assistant (DTA) Award**

## Supervision

2022-2023 **Queen's University** Claire MacDougall (M.S. student)

2022-2023 **Queen's University** Michael Kelly (B.S. student)

## Volunteering and Association

1. 2023-2024 **Rotary International Assistant Governor Rotaract**  
This is my first district leadership position. I have been selected by the Governor-Elect (23-24) as the Assistant Governor Rotaract for the district 7040 (Ontario and upstate New York). My goal is to oversee and help all Rotaract Clubs in our Area.
2. 2022-2023 **Rotaract Club of Kingston Club Treasurer & Past President**  
Rotaract International is a non-for-profit organization partner of Rotary International. The main goal is to gather together highly motivated young and early career professionals and help the local community thrive while improving leadership skills.

## Contact

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