



Luca Sciacovelli

Assistant Professor
DynFluid Laboratory
Arts & Métiers ParisTech

151 Boulevard de l'Hôpital
75013, Paris (France)

+33 (0)1 44 24 64 33

luca.sciacovelli@ensam.eu

luca_sciacovelli

0000-0002-2463-4193

luca-sciacovelli

Luca-Sciacovelli

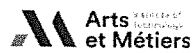
December 7th, 1988

Interests

My research focuses on the assessment of the influence of real-gas effects (dense gases, high-pressure and high-temperature mixtures) on compressible turbulent flows. These studies are carried out by means of high-fidelity numerical simulations on massively parallel architectures with in-house high-order CFD solvers.

Academic Appointments

- Sep. 2018 – currently **Assistant Professor**
ENSAM – Arts & Métiers, Paris (FR)
- Jan. 2018 – Aug. 2018 **Temporary Research and Teaching Assistant (ATER)**
CNAM – Conservatoire National des Arts et Métiers Paris (FR)
- Feb. 2017 – Dec. 2017 **Postdoctoral Research Fellow**
NASA Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California (US)
- Sep. 2016 – Jan. 2017 **Graduate Research and Teaching Assistant**
ENSAM – Arts & Métiers, Paris (FR)



Academic Training

- 2013 – 2016 **Ph.D. in Mechanical Engineering** Arts & Métiers
Thesis title: "Numerical simulation of dense gas turbulent flows", in international joint supervision with the Politecnico di Bari
- 2011 – 2012 **M.Sc. in Aerodynamics and Aeroacoustics** Arts & Métiers
Final project: "Thermodynamic Modeling and Numerical Simulation of supercritical fluid flows"
- 2010 – 2012 **M.Sc. in Mechanical Engineering** Politecnico di Bari
110/110 cum laude
- 2007 – 2010 **B.Sc. in Mechanical Engineering** Politecnico di Bari
110/110 cum laude

Current teaching activities

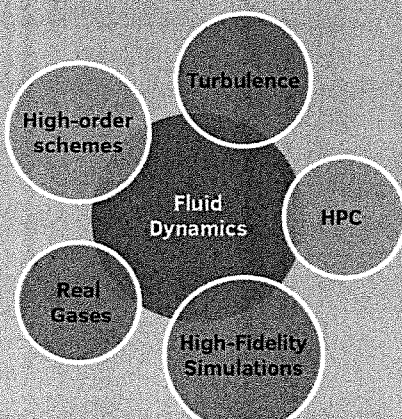
- | | |
|---|----------|
| M.Sc. High-Fidelity Simulations for Turbulent Flows | 40 hours |
| M.Sc. Introduction to StarCCM+ for CFD | 40 hours |
| M.Sc. Fluid Mechanics and Heat Transfer | 30 hours |
| M.Sc. Advanced Thermodynamics | 20 hours |
| B.Sc. Renewable energies | 50 hours |
| B.Sc. Optimization algorithms with Python | 60 hours |

Research Projects

- 2019 – Current **GENCI – Project No. 10947** Principal Investigator
Numerical simulation of hypersonic turbulent flows using advanced thermal and chemical non-equilibrium models (11 million CPU hours)
- 2018 – 2019 **GENCI "Grands Challenges" – Project HYPERBOLA** Collaborator
Dynamics of transitional and turbulent hypersonic boundary layers of dense gases (8 millions CPU hours)
- 2015 – 2018 **GENCI – Project No. 7332** Collaborator
Direct numerical simulations of turbulent flows in the dense gas regime (5 millions CPU hours)
- 2014 – 2016 **GENCI – Project No. 7085** Collaborator
Development of a massively-parallel code for compressible flows simulations by means of high-order schemes (3 millions CPU hours)

Professional Activities

- Supervisor 1 Ph.D. Thesis / 6 Research Master Thesis
- Referee for Journal of Fluid Mechanics, Flow Turbulence and Combustion, Physics of Fluids, ASME Journal of Fluids Engineering, AIAA Journal, International Journal of Thermal Sciences, ASME Turbo Expo



Luca Sciacovelli

Assistant Professor
DynFluid Laboratory
Arts & Métiers ParisTech

151 Boulevard de l'Hôpital
75013, Paris (France)

+33 (0)1 44 24 64 33

luca.sciacovelli@ensam.eu

luca_sciacovelli

0000-0002-2463-4193

luca-sciacovelli

Luca-Sciacovelli

December 7th, 1988

Languages

Italian ● ● ● ● ●
English ● ● ● ● ●
French ● ● ● ● ●

Programming

Fortran 2003
MPI-3
Python3
OpenMP
C++
Julia

Selected Publications

- 2020 **L. Sciacovelli**, X. Gloerfelt, D. Passiatore, P. Cinnella and F. Grasso
Numerical Investigation of High-Speed Turbulent Boundary Layers of Dense Gases
Flow, Turbulence and Combustion, Vol. 105(2), pp. 555–579
DOI: 10.1007/s10494-020-00133-1
- 2020 X. Gloerfelt, J.-C. Robinet, **L. Sciacovelli**, P. Cinnella and F. Grasso
Dense-gas effects on compressible boundary-layer stability
Journal of Fluid Mechanics, Vol. 893, A19
DOI: 10.1017/jfm.2020.234
- 2019 **L. Sciacovelli** and J. Bellan
The influence of the chemical composition representation according to the number of species during mixing in high-pressure turbulent flows
Journal of Fluid Mechanics, Vol. 863, pp. 293–340
DOI: 10.1017/jfm.2018.992
- 2019 **L. Sciacovelli**, X. Gloerfelt, P. Cinnella and F. Grasso
Direct Numerical Simulation of perfect- and dense-gas hypersonic boundary layers. Springer Lecture Series, in press
- 2018 **L. Sciacovelli**, P. Cinnella and X. Gloerfelt
A Priori tests of RANS models for turbulent channel flows of a dense gas
Flow, Turbulence and Combustion, Vol. 101, pp. 295–315
DOI: 10.1007/s10494-018-9938-y
- 2018 **L. Sciacovelli** and J. Bellan
Mixing in high-pressure flows: the influence of the number of species
AIAA paper
DOI: 10.2514/6.2018-1189
- 2017 **L. Sciacovelli**, P. Cinnella and F. Grasso
Small-scale dynamics of dense gas compressible homogeneous isotropic turbulence
Journal of Fluid Mechanics, Vol. 825, pp. 515–549
DOI: 10.1017/jfm.2017.415
- 2017 **L. Sciacovelli**, P. Cinnella and X. Gloerfelt
Direct numerical simulations of supersonic turbulent channel flows of dense gases
Journal of Fluid Mechanics, Vol. 821, pp. 153–199
DOI: 10.1017/jfm.2017.237
- 2017 **L. Sciacovelli**, P. Cinnella, X. Gloerfelt, and F. Grasso
DNS of turbulent flows of dense gases
Journal of Physics: Conference Series, Vol. 821(1), pp. 012018
DOI: 10.1088/1742-6596/821/1/012018
- 2016 **L. Sciacovelli**, P. Cinnella, C. Content and F. Grasso
Dense gas effects in inviscid homogeneous isotropic turbulence
Journal of Fluid Mechanics, Vol. 800, pp. 140–179
DOI: 10.1017/jfm.2016.393
- 2014 **L. Sciacovelli** and P. Cinnella
Numerical study of multistage transcritical organic Rankine cycle axial turbines
Journal of Engineering for Gas Turbines and Power, Vol. 136(8), pp. 082604
DOI: 10.1115/1.4026804

Awards and Honours

- 2016 Finalist for “Pierre Bézier 2016” award for the best Ph.D. Thesis of Arts & Métiers
- 2015 Granted the “Vinci 2015” scholarship from the “Université Franco-Italienne” for the Ph.D. research project
- 2012 Best student of the M.Sc. “Aerodynamics and Aeroacoustics” of Arts & Métiers ParisTech for the year 2011–2012