IL PRESENTE ALLEGATO COSTITUISCE UNO SCHEMA-TIPO, NEL QUALE SONO INDICATE ALCUNE VOCI A MERO TITOLO ESEMPLIFICATIVO, PERTANTO PUO' ESSERE MODIFICATO/INTEGRATO DAL CANDIDATO ADATTANDOLO ALLE PECULIARITÀ DELLA PROPRIA ATTIVITÀ SCIENTIFICO-PROFESSIONALE

ALL. B

Decreto Rettore Università di Roma "La Sapienza" n 1828/2018 del 31/07/2018

FRANCESCO BATTISTA
Curriculum Vitae

Place Roma
Date 25/08/2018

Part I – General Information

Full Name	Francesco Battista
Date of Birth	
Place of Birth	
Citizenship	
Permanent Address	
Mobile Phone Number	
E-mail	
Spoken Languages	Italiano (Madrelingua), Inglese

Part II – Education

Type	Year	Institution	Notes (Degree, Experience,...)
University graduation	2005	La Sapienza University of Rome	Aerospace Engineering 110/110 cum laude
University graduation	2008	La Sapienza University of Rome	Aeronautical Engineering 110/110 cum laude
PhD	2012	La Sapienza University of Rome	Theoretical and Applied and Mechanics
Specialty			
Pre-doctorate training			
Licensure 01	2008	La Sapienza University of Rome	License to practice as an engineer
Licensure 02	2018	MIUR	Abilitazione Scientifica Nazionale II fascia, SC 09/A1

Part III – Appointments

IIIA – Academic Appointments

Start End Institution Position

2014	2019	University "La Sapienza"	Researcher (RTD-A)
2013	2014	University "La Sapienza"	Post-doc (Assegno di Ricerca)
2012	2013	University "La Sapienza"	Post-doc (Assegno di Ricerca)

IIIB – Other Appointments

Start	End	Institution	Position

Part IV – Teaching experience

Year	Institution	Lecture/Course
2018	University "La Sapienza", Aerospace Engineering degree	Professor of the course 'Laboratorio di Calcolo di Aerodinamica' (3CFU)
2018	University "La Sapienza", Mechanics Engineering degree	Professor of the course 'Laboratorio di Aerodinamica del Veicolo' (3CFU)
2017	University "La Sapienza", Aerospace Engineering degree	Professor of the course 'Laboratorio di Calcolo di Aerodinamica' (3CFU)
2017	University "La Sapienza", Mechanics Engineering degree	Professor of the course 'Laboratorio di Aerodinamica del Veicolo' (3CFU)
2017	University "La Sapienza", Physics degree	Professor of the course 'Fluidodinamica per l'Astrofisica' (6CFU)
2016	University "La Sapienza", Mechanics Engineering degree	Professor of the course 'Laboratorio di Aerodinamica del Veicolo' (3CFU)
2015	University "La Sapienza", Mechanics Engineering degree	Professor of the course 'Laboratorio di Aerodinamica del Veicolo' (3CFU)
2015	University "La Sapienza", Mechanics Engineering Batchelor degree	Course of 'Calcolo Numerico' (3CFU)
2014	University "La Sapienza", Mechanics Engineering Batchelor degree	Course of 'Calcolo Numerico' (3CFU)
2013	University "La Sapienza", Mechanics Engineering Batchelor degree	Course of 'Calcolo Numerico' (3CFU)
2013	University "La Sapienza", Mechanics Engineering Master degree	Lectures to the course 'Laboratorio di Combustione e Turbolenza' (3CFU)
2012	University "La Sapienza", Mechanics Engineering Master degree	Lectures to the course 'Laboratorio di Combustione e Turbolenza' (3CFU)
2012	University "La Sapienza", Mechanics Engineering Batchelor degree	Tutor of the course 'Fluidodinamica'
2011	University "La Sapienza", Mechanics	Tutor of the course 'Fluidodinamica'

	Engineering Batchelor degree	
2011	University of Bologna, Mechanics Engineering Master degree	Lectures to the Computational Fluid Dynamics Course

Part V - Society memberberships, Awards and Honors

Year	Title
2018	Euromech Member
2017	Euromech Member
2016	Euromech Member
2015	Euromech Member
2014	Euromech Member
2013	Euromech Member
2012	Euromech Member
2011	Euromech Member
2010	Euromech Member

Part VI - Funding Information [grants as PI-principal investigator or I-investigator]

Year	Title	Program	Grant value
2018	Drag reduction induced by superhydrophobic surfaces: Reynolds number scaling.	ISCRA B project HP10BA82N5 (PI)	493750 CPU hours on Marconi-KNL
2017	Droplets evaporation in turbulence: reactive and non-reactive flows (DrEvaT)	3 years Post-doc Ser Cymru MSCA COFOUND fellowship (non accettata per altre offerte)	151675.54 £ per year
2017	Abdominal aortic aneurysm: understanding the fluid dynamics of endograft stents	Grandi Progetti Sapienza 2017 (I)	31100.00 €
2016	Bubble dynamics in turbulent channel flow with lower curved wall	ISCRA B project HP10BLVPKA (PI)	491520 CPU hours on Marconi-KNL
2016	Turbulence modulation by micro-bubbles in shear flows	PRACE Tier-0 project 2016143316 (I)	41848830 Cpu hours on Marconi-KNL
2016	Turbulence modification in a pipe flow due to superhydrophobic walls	ISCRA C project HP10C0NUTY (PI)	1000000 CPU hours on Fermi
2015	Turbulent Separation on a Curved Wall	ISCRA C project HP10C3NW7O (PI)	1000000 CPU hours on Fermi
2015	Turbulence dynamics in the	PRACE Tier-0 10th call	50000000 CPU

	separation region of channels with lower curved walls	project 2014112647 (I)	hours on fermi
2014	Studio numerico sperimentale della formazione di gocce in flussi bifase.	Progetti Sapienza per l'avvio alla ricerca 2014 (I)	2500€
2014	TCSF – Turbulence-combustion interaction in Syngas flame	PRACE Distributed European Computing Initiative (DECI-12) (PI)	2000000 CPU hours
2013	ERPP - Exact Regularized Point Particle Method for the momentum coupling in particle-laden turbulent flows	PRACE Distributed European Computing Initiative (DECI-10) (I)	5910000 CPU hours
2013	Studio numerico sperimentale di un getto turbolento con particelle pesanti	Progetti Sapienza per l'avvio alla ricerca 2013 (PI)	3000€
2012	Studio di getti turbolenti in condizioni supercritiche	Progetti Sapienza per l'avvio alla ricerca 2012 (PI)	2000€

Part VII – Research Activities

Keywords	Brief Description
Turbulent Combustion	The turbulent structures effects on the combustion is investigated by means both experimental measurements and especially numerical simulations of Bunsen premixed flame. The aim is two-fold and consists in the understanding physical phenomena, e.g. thermo-diffusive instability or flame speed enhanced by turbulence, and the development of models for high Reynolds number simulations. The attention is now devoted to hydrogen, hydrogen-based fuels or methane reacting with air.
Inertial particle dynamics	The effects of turbulence and combustion on the particle dynamics and their preferential concentration is addressed. The topics are addressed both with numerical simulations and experimental measurements. From the numerical point of view the particle dynamics in turbulent jet and in homogeneous shear flow is addressed also considering the mutual momentum exchange between fluid and particles.
Supercritical flow	The mixing in turbulent jet at supercritical thermodynamic conditions is addressed in order to highlight the difference occurring between the atmospheric pressure and supercritical conditions.
Bubble dynamics	The rising dynamics of bubble is studied by means of numerical simulation of a two phase flow reproduced through a suitable model (Cahn-Hilliard model). The same model is used to study the turbulence-induced break-up and coalescence of bubbles with dimension greater than the Kolmogorov scale. Sub-Kolmogorov bubble dynamics and spatial distribution in turbulent flows is studied by means of numerical simulations of homogeneous shear flow, turbulent periodic pipe flow, and turbulent jet.
Hemodynamics	The blood flow in artery realistic geometries (coronaries and carotids) is studied by means the numerical simulation. The blood is modelled by

	means a Newtonian fluid (plasma) laden with small particles (red blood cells). The fluid and particles dynamics is forced by the momentum exchange between the to phases and the hydrodynamics interaction between particles.
Drag Reduction	Superhydrophobic surfaces, immersed in liquid turbulent flows, are able to entrap air bubble separating the liquid by the wall and then producing a slip which result in an overall drag reduction. This effect is investigated in turbulent flow by means direct numerical simulation to analyse the effect both on the friction drag and on the form drag in two different configuration, the pipe and the channel with a bump (which induce a flow separation), respectively.
Turbulent separation	The dynamics of the turbulent in separated flow is investigated from the fundamental point of view by analysing the kinetic energy budged in the scale and physical spaces by means the Generalised Kolmogorov Equation. The turbulent flow inside a channel decorated with a bump at the lower wall is numerically simulated to obtain the data for the analysis.

Part VIII – Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Papers [international]	15	www.scopus.com	2011	2018
Papers [national]				
Books [scientific]				
Books [teaching]				

Total Impact factor	22.88
Mean Impact factor	1,53
Total Citations	65
Average Citations per Product	4.33
Hirsch (H) index	5
Normalized H index*	0.71 (seniority: 7 years from the first publication) 0.83 (seniority: 6 years from the end of the PhD)

*H index divided by the academic seniority.

Part IX– Selected Publications

List of the publications selected for the evaluation. For each publication report title, authors, reference data, journal IF (if applicable), citations (CN), press/media release (if any).

F Battista, P Gualtieri, J-P Mollicone, and CM Casciola. "Application of the exact regularized point particle method (erpp) to particle laden turbulent shear flows in the two-way coupling regime." *International Journal of Multiphase Flow*, 2018. (IF = 2.592)

R Costantini, J-P Mollicone, and F Battista. "Drag reduction induced by superhydrophobic surfaces in turbulent pipe flow." *Physics of Fluids*, 30(2):025102, 2018 (IF = 2.279)

FB

J-P Mollicone, F Battista, P Gualtieri, and CM Casciola. "Turbulence dynamics in separated flows: the generalised kolmogorov equation for inhomogeneous anisotropic conditions." *Journal of Fluid Mechanics*, 841:1012–1039, 2018 (IF = 2.893, CN = 1)

J-P Mollicone, F Battista, P Gualtieri, and CM Casciola. "Effect of geometry and reynolds number on the turbulent separated flow behind a bulge in a channel." *Journal of Fluid Mechanics*, 823:100–133, 2017 (IF = 2.893, CN = 4)

P Gualtieri, F Battista, and CM Casciola. "Turbulence modulation in heavy-loaded suspensions of tiny particles." *Physical Review Fluids*, 2(3):034304, 2017 (IF = 2.021, CN = 2)

F Battista, G Troiani, and F Picano. "Fractal scaling of turbulent premixed flame fronts: Application to les." *International Journal of Heat and Fluid Flow*, 51:78–87, 2015 (IF = 1.737, CN = 5)

G Rocco, F Battista, F Picano, G Troiani, and CM Casciola. "Curvature effects in turbulent premixed flames of h2/air: A dns study with reduced chemistry." *Flow, Turbulence and Combustion*, 94(2):359–379, 2015 (IF = 1.863, CN = 6)

F Battista, F Picano, and CM Casciola. "Turbulent mixing of a slightly supercritical van der Waals fluid at low-Mach number." *Physics of Fluids (1994-present)* 26.5 (2014): 055101. (IF=2.031, CN = 8)

G Troiani, F Battista, and F Picano. "Turbulent consumption speed via local dilatation rate measurements in a premixed bunsen jet." *Combustion and Flame* 160.10 (2013): 2029-2037. (IF=3.708, CN = 6)

F Battista, F Picano, G Troiani, and CM Casciola. "Intermittent features of inertial particle distributions in turbulent premixed flames." *Physics of Fluids (1994-present)* 23.12 (2011): 123304. (IF=1.926, CN=8)

F Picano, F Battista, G Troiani, and CM Casciola. "Dynamics of PIV seeding particles in turbulent premixed flames." *Experiments in Fluids* 50.1 (2011): 75-88. (IF=1.735, CN=23)

F Battista, M Froio, F Picano, P Gualtieri, and CM Casciola. "Bubble-Turbulence Interaction in Binary Fluids." *Journal of Physics: Conference Series*. Vol. 318. No. 9. IOP Publishing, 2011. (IF=0.477)

Part IX– International and National Conferences

a) Speaker

F Battista, P Gualtieri, J-P Mollicone, and CM Casciola. Turbulence modulation induced by inertial particles in round jet. In *Euromech Colloquium 596*, 9-11 May 2018 2018

F Battista, P Gualtieri, and CM Casciola. Particle-laden turbulent jet in two way coupling regime. In *Associazione Italiana Meccanica Teorica e Applicata XXIII*, 14-17 September 2017

F Battista, P Gualtieri, and CM Casciola. Particle laden turbulent jet in two-way coupling regime. In *11th European Fluid Mechanics Conference*, 2016

F Battista, G Sinibaldi, P Gualtieri, and CM Casciola. Two way coupling in particle- laden turbulent jet. In *9th International Conference on Multiphase Flow*, Firenze, 22-27 May 2016

F Battista, P Gualtieri, and CM Casciola. Turbulence modulation due to inertial particles: exact regularized point particle method. In *Associazione Italiana Meccanica Teorica e Applicata XXII*, 14-17 September 2015

F Battista, R Messina, P Gualtieri, and CM Casciola. Turbulence modulation in particle laden pipe flow: Exact regularized point particle method. In *15th European Turbulence Conference*, Delft, 25-28 August 2015

F Battista, F Picano, G Troiani, and CM Casciola. Numerical simulation of syngas turbulent premixed bunsen flame. In *10th European Fluid Mechanics Conference*, September 2014

F Battista, F Picano, G Troiani, and CM Casciola. Turbulence-combustion interaction in h2/co/air bunsen flame. In *14th European Turbulence Conference*, 1-4 September 2013

F Battista, F Picano, G Troiani, and CM Casciola. Direct numerical simulation of hydrogen- carbon monoxide premixed turbulent flame. In *Direct and Large-Eddy Simulation IX*, 3-5 April 2013

F Battista, F Picano, G Troiani, and CM Casciola. Direct numerical simulation of co-h2 pre- mixed turbulent flame. In *35th Meeting on Combustion of Italian Combustion Institute*, Milan, 10-12 October 2012

I Aniballi, F Battista, L Marino, and CM Casciola. Dynamics of turbulent supercritical jets. In *European Turbulence Conference 9*, 4-7 September 2012

F Battista, M Froio, F Picano, P Gualtieri, and CM Casciola. Bubble-turbulence interaction in binary fluid. In *13th European Turbulence Conference*, 12-15 September 2011

F Battista, F Picano, G Troiani, and CM Casciola. Transport of inertial particles in a turbulent premixed jet flame. In *13th European Turbulence Conference*, 12-15 September 2011

F Battista, F Picano, G Troiani, and CM Casciola. Inertial particles in turbulent premixed bun- sen flames. In *Proceedings of Interdisciplinary Turbulence Initiative Conference on Turbulence 4*, 19-23 September 2010

F Battista, F Picano, G Troiani, and CM Casciola. Turbulent premixed flames with dispersed inertial particles. In *European Fluid Mechanics Conference 8*, 13-16 September 2010

F Battista, F Picano, G Troiani, and CM Casciola. Dns of variable density jet in the supercritical thermodynamics state. In *Direct and Large-Eddy Simulation VII*, July 2010

F Battista, F Picano, G Troiani, and CM Casciola. Inertial particles dynamics in turbulent premixed flames. In *7th International Conference on Multiphase Flows*, June 2010

F Battista, F Picano, G Troiani, and CM Casciola. Effects of particle inertia on piv measure- ments of turbulent premixed flames. In *Associazione Italiana Meccanica Teorica e Applicata XIX*, September 2009

b) Co-Author

J-P Mollicone, F Battista, P Gualtieri, and CM Casciola. Turbulent transport of micro-bubbles and micro-particles in complex geometry. In *Euromech Colloquium 596*, 9-11 May 2018 2018

P Gualtieri, F Battista, J-P Mollicone, and CM Casciola. Wall turbulence modulation as predicted by the exact regularized point particle method. In *Euromech Colloquium 596*, 9-11 May 2018 2018

P Gualtieri, F Battista, and CM Casciola. Dynamics of micro-bubbles in turbulent shear flows. In *11th European Fluid Mechanics Conference*, 2016

JP Mollicone, F Battista, P Gualtieri, and CM Casciola. Scale-by-scale turbulence dynamics in an obstructed channel. In *11th European Fluid Mechanics Conference*, 2016

R Costantini, F Battista, and CM Casciola. Effect of superhydrophobic boundary conditions on turbulent structures in a pipe flow. In *11th European Fluid Mechanics Conference*, 2016

R Messina, F Battista, P Gualtieri, and CM Casciola. Wall turbulence modification due to inertial particles: Application of exact regularized point particle method. In *9th International Conference on Multiphase Flow*, Firenze, 22-27 May 2016

R Costantini, F Battista, and CM Casciola. Drag reduction in turbulent pipe flow induced by superhydrophobic surface. In *9th International Conference on Multiphase Flow*, Firenze, 22-27 May 2016

P Gualtieri, F Battista, and CM Casciola. Modeling inter-phase momentum coupling via the exact regularized point particle method. In *9th International Conference on Multiphase Flow*, Firenze, 22-27 May 2016

P Gualtieri, F Battista, and CM Casciola. Transport of micro-bubbles in turbulent shear flows. In *9th International Symposium in Cavitation*, 6-10 December 2015

P Gualtieri, F Battista, and CM Casciola. An innovative approach for the simulation of particle- laden flows: exact regularized point particle method. In *Associazione Italiana Meccanica Teorica e Applicata XXII*, 14-17 September 2015

G Sinibaldi, F Battista, P Gualtieri, L Marino, GP Romano, and CM Casciola. Experiments and dns of a round jet with turbulent inlet. In *Associazione Italiana Meccanica Teorica e Applicata XXII*, 14-17 September 2015

P Gualtieri, F Battista, and CM Casciola. Turbulence modulation in particle laden homo- geneous shear flow: Exact regularized point particle method. In *15th European Turbulence Conference*, Delft, 25-28 August 2015

JP Mollicone, F Battista, and CM Casciola. Separation in wall turbulence. In *15th European Turbulence Conference*, Delft, 25-28 August 2015

G Sinibaldi, F Battista, P Gualtieri, L Marino, GP Romano, and CM Casciola. Experiments and dns of a round jet with turbulent inlet. In *15th European Turbulence Conference*, Delft, 25-28 August 2015

JP Mollicone, F Battista, P Gualtieri, and CM Casciola. Turbulence dynamics in the separated region of channel flow with a lower curved wall. In *Turbulence Heat and Mass Transfer 8*, Sarajevo, 14-18 September 2015

CM Casciola, F Battista, and CM Casciola. Particle laden homogeneous shear flow in the two-way coupling regime: Exact regularized point particle method. In *Turbulence Heat and Mass Transfer 8*, Sarajevo, 14-18 September 2015

R Messina, F Battista, P Gualtieri, and CM Casciola. Application of the exact regularized point particle method to turbulent pipe flow in the two-way coupling regime. In *Turbulence Heat and Mass Transfer 8*, Sarajevo, 14-18 September 2015

JP Mollicone, F Battista, and CM Casciola. Dns of a lower curved wall channel: turbulent separation. In *Direct and Large-Eddy Simulation X*, 27-29 May 2015

R Costantini, F Battista, and CM Casciola. Turbulence modification in a pipe flow due to superhydrophobic walls. In *Direct and Large-Eddy Simulation X*, 27-29 May 2015

R Messina, F Battista, P Gualtieri, and CM Casciola. Particle laden pipe flows: turbulence modulation. In *Direct and Large-Eddy Simulation X*, 27-29 May 2015

G Troiani, F Battista, F Picano, and CM Casciola. Turbulent consuption speed and local dilatation rate measurements in a premixed bunsen jet. In *AIVELA XXII*, December 2014

JP Mollicone, F Battista, and CM Casciola. Turbulence dynamics in the separation bubble on a lower curved wall channel. In *10th European Fluid Mechanics Conference*, September 2014

R Messina, F Battista, S Melchionna, and CM Casciola. Hemodynamic simulation in real vessel geometry at physiological hematocrit. In *10th European Fluid Mechanics Conference*, September 2014

G Troiani, F Battista, F Picano, and CM Casciola. Curvature and velocity strain dependencies of burning speed in a turbulent premixed jet flame. In *14th European Turbulence Conference*, 1-4 September 2013

G Troiani, F Battista, F Picano, and CM Casciola. Front evolution and flame stretch in a turbu- lent premixed bunsen flame. In *35th Meeting on Combustion of Italian Combustion Institute*, Milan, 10-12 October 2012

G Troiani, F Battista, F Picano, and CM Casciola. Flame surface evolution and flame stretch in a turbulent premixed jet flame. In *European Turbulence Conference 9*, 9-13 September 2012

M Lucchesi, F Battista, and CM Casciola. Thermophoresis in particle laden flames. In *European Turbulence Conference 9*, 9-13 September 2012

CM Casciola, F Battista, G Sardina, F Picano, G Troiani, P Gualtieri, and R Piva. Vorticity induced anomalous effects in particle laden flows. In *5th International Conference on Vortex Flows and Vortex Models*, 7-10 November 2010

ROMA, 25/08/2018

Francesco Battista