Curriculum Vitae

SANTINI Maurizio

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Professional Development

Since 2017	Board Member of the Ph.D. School (Engineering and Applied Science)
Since 2016	Delegate of the Rector as supervisor in the Framework agreement with the National Synchrotron facility (Società Elettra – Sincrotrone Trieste S.C.p.A.)
Since 2015	Reviewer for the DAAD "Deutscher Akademischer Austauschdienst" (German Academic Exchange Service)
VQR 2011-2014	0,7/1,0
2013	Awarded by the University of Bergamo (IT): "5x1000" prize for the best university researchers
Since 2012	Delegate of the Rector as supervisor in the International Cooperation Agreement signed between University of Stuttgart (DE) and University of Bergamo (IT)
VQR 2004-2010	2,8/3,0
Since 2009	Board Member of the Centre on Innovation Management and Technology Transfer (GITT) at University of Bergamo (IT)
Since 2008	Erasmus coordinator between the University of Stuttgart (DE) and University of Bergamo (IT)
Since 01/02/2005	Assistant Professor (permanent position) at University of Bergamo (IT)
16/03/2005	Ph.D. in Industrial Engineering, Doctor Thesis at University of Parma (IT) titled: "Effect of surface properties on secondary atomization by impact of drops over heated surfaces"
13/04/2000	Graduate in Management Engineering at University of Bergamo (IT)

Projects

2018 – 2021	External Partner in the CRC 1313: Droplet Interface-Driven Multi-Field Processes in Porous Media (International Project with the University of Stuttgart)
2016 – 2020	Principal Investigator in the GRK 2160/1: Droplet Interaction Technologies – DROPIT (International Project with the University of Stuttgart)
2015	Scientist in charge for the project SRP-NUPUS (Stuttgart Research Partnership-iNterdisciplinary Union of Porous media research at the University of Stuttgart)
2014 – 2016	Principal Investigator in the Academic Project ITALY® (University of Bergamo) "Microtomografia a raggi X: strumento interdisciplinare per le scienze"
2010 – 2012	Principal Investigator and lead partner in the International Research Project "Fluids/porous X-Ray μ-tomography", within the frame of the regional (Lombardia) call for Technological and Scientific Cooperation Agreements, international partner: Institut für Thermodynamik der Luft- und Raumfahrt (ITLR), University of Stuttgart (Germany)
2005	Research fellow in the European Project DITICE-Regins: "Drop Impact TechnologIes for Cleaner combustion Engines"
2002 – 2006	Supervisor of Ph.D. Students training in the European FP6 for the Marie Curie Program "Spray/wall interaction processes related to a direct injection spark ignited (DISI) engine (TOPHD)"
2000 – 2003	Research fellow in the European Project DWDIE: "Droplet Wall interaction phenomena of relevance for Direct Injection gasoline Engines"

Furthermore, he was involved and financed in 2002, 2005, 2007 and 2009 for the national Italian research programs PRIN.

Research Skills

He has been performing different research activities, among which:

- application and development of optical and X-rays micro-tomography techniques to characterize two-phase flows in porous materials and fluid/wall interactions;
- thermodynamics of liquid interfaces, impact of liquid drops on solid surfaces dry and wetted, below and above Leidenfrost temperature;
- use of optical laser techniques like Phase Doppler Anemometry, visualization techniques (high-speed camera) with development of numerical codes for automatic image analysis;
- modeling of thermal transient and complex geometries and use of numerical codes for the solution of the inverse problem (IHCP) in convective regimes;
- designed and developed a multi-purpose thermo-mechanical sensor with small response time.

Teaching

He is in charge of different courses of "Fisica Tecnica" (Technical Physics: Thermodynamic and Heat Transfer) at the University of Bergamo, since 2005, and several related tutoring since 2000. He has supervised until now a number of undergraduate and graduate students (included foreigners within the Erasmus programs) and Ph.D. students (some foreigners).

A.A. 2006 – 2008	Courses of Technical Physics to the *textile engineering* bachelor degree
A.A. 2008 – 2009	Course of Technical Physics to the *civil engineering* bachelor degree
Since A.A. 2010	Courses of Technical Physics to the *management engineering* and *informatics engineering* bachelor degree
Since A.A. 2017	Courses of Technical Physics to the *technology engineering for health* bachelor degree
Since A.A. 2015	Course of Energy Saving Techniques in Buildings to the *civil engineering* master degree
A.A. 2012 – 2017	Several Tutoring of Thermo-Fluid dynamics to the *mechanical engineering* master degree

He has held since 2009 several seminars on fundamentals and applications of heat and mass transfer in experimental investigations, to Ph.D. students and within the yearly Erasmus mobility to the ITLR (Institute of Aerospace Thermodynamics) at University of Stuttgart.

Granted patents

- Patent recorded 0001416638 on 03/07/2015.
  Title of the invention "UTENSILE PER LA FORMAZIONE E IL DISTACCO DI GOCCE DI FLUIDO IN CONDIZIONI SUPERCRITICHE"
- Patent pending MI-2014-A-002179 on 18/12/2014. Title of the invention "METODO DI ANALISI DI CAFFÈ MACINATO", issued in U.S.A. application number 14/972,935.
  Title of the invention "METHOD OF ANALYSING GROUND COFFEE", extended to: EP3035049A1; JP2016118549A; CN105717003A
- International PCT application 000554, Applicant E6423/08-WO on 22/08/2008.
  Title of the invention: "DEVICE AND METHOD FOR DROPS GENERATION"

Research expeditions

He was involved as Principal Investigator with the experiment "PS-47/C Test of drop generator for the DOLFIN project" in the European Space Agency Parabolic Flight Campaign 47, from 10 to 21 December 2008, on board of Airbus A-300 Zero-G aircraft.
His work can be briefly summarized on the following: perform experiments aimed to exploit microgravity (μG) for collecting information about the drop formation and impact onto solid surfaces. This can be correctly performed only if it is possible to produce single liquid drops with controlled velocity and with low amplitude oscillations. To this end a drop generator has been designed and realized at University of Bergamo to produce such drops. The main objective of the campaign of parabolic flights was being to test the correct functioning of this apparatus in μG conditions and to explore the working ranges.
This was partially financed by European Science Foundation COST P21 as Short Term Scientific Mission (STSM).

Academy membership

- *ILASS-Europe*, Institute for Liquid and Spray System
  http://www.ilass.uci.edu
- *UIT*, Unione Italiana di Termofluidodinamica
  http://www.uitonline.it/default.asp
- *FTI*, Associazione della Fisica Tecnica Italiana
  http://www.fisicatecnica.org
- *European Space Agency*, Topical Team "Liquid-Wall Interactions"
  http://www.spaceflight.esa.int/users/index.cfm?act=default.page&level=16&page=coord-tt
- *COST P21* "The Physics of droplets", European Cooperation in the field of Scientific and Technical Research
  http://www.costp21.ulg.ac.be

He is also reviewer of several international journals on heat transfer, thermodynamics, fluid mechanics, colloid and interfaces.

He is reviewer for national and international projects.

Participation in International Conferences
He has participated, with 31 contributions, to scientific international conferences since 2002, mostly as speaker. In some of these international congresses he has also chaired thematic sessions. In 2015, at the XXXIII UIT HEAT TRANSFER CONFERENCE, he helds an invited Technical Seminar on "Fundamentals and recent advances in X-ray microcomputed tomography (microCT) applied on thermal-fluid dynamics and multiphase flows".

Organization of International Conferences

He was the Conference Secretary of the 22th International Conference of Institute for Liquid Atomization and Spray System (*ILASS-Europe*), 8-10 September 2008, Como Lake, Italy.

Direction and participation in the activities of a research group characterized by collaborations at national or international level

11/2000 – 10/2003	Participation as Research Fellow to the European Project "Droplet-wall-interaction phenomena of relevance to direct injection gasoline engines (DWDIE)" (Coordinator: ROBERT BOSCH GmbH). The main activities have dealt with the experimental analysis of drop impact onto wetted and heated surfaces and with spray characterization.
10/2002 – 09/2006	Supervisor of Ph.D. Students training in the European FP6 for the Marie Curie Program "Spray/wall interaction processes related to a direct injection spark ignited (DISI) engine (TOPHD)".
12/2002 – 01/2005	Participation as Ph.D. Student in the National Research Project (PRIN 2002) on "Influence of thermo-physical and morphological characteristics of a heated surface on the secondary atomization of an impacting drop"
01/2005 – 12/2005	Participation as Research Fellow to the European Project DITICE-2E0006R Interreg III FESR (Fondo europeo di sviluppo regionale per la cooperazione tra regioni dell'Unione europea per il periodo 2000-2006) and REGINS (REGional standardised Interfaces for a better integration of regional SMEs in the European Economy): "Drop Impact TechnologIes for Cleaner combustion Engines".

01/2006 – 02/2008 Participation as Research Fellow in the National Research Project (PRIN 2005) on "Experimental and numerical analysis of droplet array impact on dry, heated, or wetted by liquid surfaces".

09/2008 – 10/2010 Participation as Assistant Professor in the National Research Project (PRIN 2008) on "Numerical and experimental study of transport and impact phenomena in spray applications for fire-fighting applications".

Since 26/05/2015 Scientist in charge for the project SRP-NUPUS founded by the University of Stuttgart in 2015. The central aspects of the SRP-NUPUS (Stuttgart Research Partnership-iNterdisciplinary Union of Porous media research at the University of Stuttgart) are to bring scientists, especially Early Career Investigators, and students in the field of porous media with different educational backgrounds and research interests together and give them a platform to exchange ideas, transfer know-how and foster the extension of the frontiers of human knowledge.

Scientific Responsibility for International and National Research Projects, admitted to Financing on the basis of competitive calls with peer review

10/2010 – 09/2012 Principal Investigator (PI) and lead partner in the International Research Project "Fluids/porous X-Ray μ-tomography" (304k€), within the frame of the regional (Lombardia) call for Technological and Scientific Cooperation Agreements, international partner: Institut für Thermodynamik der Luft- und Raumfahrt (ITLR), University of Stuttgart (Germany).

11/2013 – 07/2016 Principal Investigator (PI) in the Academic Project ITALY® (University of Bergamo) "Microtomografia a raggi X: strumento interdisciplinare per le scienze"

Since 10/2016 Principal Investigator (PI) in the GRK 2160/1: DROPlet Interaction Technologies (DROPIT) for a duration of 4.5 years (in total approved 3.924M€).
http://www.uni-stuttgart.de/itlr/graduierten/dropit.php

Formal assignment of teaching or research assignments (fellowships) at qualified universities or foreign or supranational research institutes

08/2001 Fellowship at Imperial College of Science and Technology of London (UK), financed by British Council

07/2007 – 12/2007 Research fellow (visiting) in the project of the GRK 1114 „Optische Messtechniken für die Charakterisierung von Transportprozessen an Grenzflächen" (Optical Techniques for Measurement of Interfacial Transport Phenomena) at Technische Universität Darmstadt, SLA Fachgebiet Strömungslehre und Aerodynamik (Chair of Fluid Mechanics and Aerodynamics, Prof. C. Tropea).

07/2008 – 12/2008 Senior research scientist (visiting) at Universität Stuttgart, ITLR Institut für Thermodynamik der Luft- und Raumfahrt (Institute of Aerospace Thermodynamics, Prof. B. Weigand).