

Carlo Antonini, PhD

Associate professor
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Citizenship: Italian

EDUCATION

- 2008-2011 PhD, Industrial Engineering, Technologies for Energy and Environment, University of Bergamo, Italy.
Thesis: “Superhydrophobicity as a strategy against icing”.
Visiting PhD student at University of Alberta, Canada (2008).
- 2004-2007 MSc, Aeronautical Engineering (major: Aerodynamics), Politecnico di Milano, Italy.
Thesis: “Prediction of the dynamic response of pipe systems” (105/110).
Erasmus exchange student, RWTH Aachen, Germany (2005).
- 2001-2004 BSc, Aerospace Engineering, Politecnico di Milano, Italy.
Thesis: “Introduction to glider design: aerodynamic design” (110/110 cum laude).

RESEARCH AND MANAGEMENT APPOINTMENTS

- since 2021 Associate professor, Department of Materials Science, University of Milano-Bicocca, Milan, Italy. Founder and director of SEFI Lab, Surface Engineering and Fluid Interfaces Laboratory.
- since 2017 Scientific Advisor, ApiTech. Innovative start-up, providing support in R&I for SMEs associated to Api Lecco, Italy.
- 2018-2021 Tenure-track researcher, Department of Materials Science, University of Milano-Bicocca, Milan, Italy.
- 2015-2018 Scientist, EMPA - Swiss Federal Laboratories for Materials Science and Technology (ETH Domain), Dübendorf, Switzerland.
- 2012-2014 Marie Curie Fellow (Post-doc), Laboratory of Thermodynamics in Emerging Technologies, Department of Mechanical and Process Engineering, ETH Zurich, Switzerland.
- 2011-2012 Post-doc and Group Leader for the area “drops and spray”, Thermal Physics Laboratory, Department of Industrial Engineering, Università degli Studi di Bergamo, Italy.
- 2006 Intern, Performance Department, Rolls-Royce plc, Derby, UK.

INDUSTRIAL COLLABORATIONS AND PROJECTS

- 2019-2022 Scientific advisor for industrial projects of SME. Topics: advanced manufacturing, data analysis, I4.0 (120 k€).
- 2017-2018 Innovation and project manager for industrial projects of SME. Topics: advanced manufacturing, data analysis, I4.0 (10 projects/year, value 6-30 k€/project).
- 2016-2018 Nanocellulose highly porous materials for selective oil absorbing materials (total: 750'000 CHF, host institution: 370'000 CHF).
- 2015-2016 Cellulose based systems for thermal insulation in buildings, Isofloc GA, Switzerland (total:

	360'000 €, host institution: 180'000 €).
2012	Development of washing machine with no-wrinkle cycles, Whirlpool Europe, Italy.
2012	Technological development of a prototype for icing mitigation system, Alenia Aermacchi, Italy (72'600 €).
2011-2012	Thermal optimization and technological innovation of sterilization machine systems, W&H ITALIA srl, Italy.
2011-2012	Heat pipe cooling for radiation detectors, TNE Nuclear, Italy.
2011-2012	Thermal optimization of nylon extrusion process, Technoform Bautech Italia SpA, Italy.
2010-2011	Characterization of droplet impact on superhydrophobic cold and heated surfaces, before and after ageing, Alenia Aermacchi, Italy (15'500 €).

GRANT SUPPORT

63,000 € 2021-2024	Funding for a PhD project on “Physical-chemical characterization of natural polysaccharides and their derivatives: understanding their properties in solution and their interaction with biological molecules” (63 k€), funded by Ronzoni Institute of Chemistry and Biochemistry.
50,000 € 2021-2023	Supervisor of the research project WaterHAB “Engineering bio-inspired atmospheric Water Harvesters through fog collection with Badgir architecture”, aimed at developing novel materials and systems for atmospheric water harvesting. The project PI is Dr. Raziye Akbari, post-doc in the SEFI Lab group.
730,000€ 2021-2024	Coordinator MSC-ITN proposal, SURFICE “Smart surface design for efficient ice protection and control”. Overall budget: 3.5 M€, UNIMIB budget: 730 k€.
63,000€ 2019-2022	Funding for a PhD project on Metal additive manufacturing by DLP – Digital Light Processing (63 k€), funded by Regione Lombardia-Enea.
25,000€ 2019-2021	“Fondo Ateneo Quota Competitiva” - UNIMIB internal funding.
230,000€ 2018-2021	Rita Levi Montalcini Fellowship from the Italian Ministry of University and Research for the project: “REPHOB: REsilient superhydroPHOBic surfaces under adverse conditions”. The Fellowship is designed to attract researchers from abroad.
17,000 € 2017-2021	Visiting Research Grant from Xi'an Jiaotong University, China, for two projects: “Characterization and optimization of lightweight cellulose foams for oil/water separation by drop impact tests” and “Efficient separation of compound drops for clean water”
192,000 € 2012-2014	Research Grant as Marie Curie Fellow from the European Research Council (ERC) for the project “ICE ² : ICEphobicity for severe ICing Environments”.
30,000 € 2014	ETH funding for high-speed visualization and measurement system for studying rapid interfacial phenomena on micro- and nano-engineered surfaces (Co-PI).
8,000 € 2008	Scholarship to support the visiting period at the University of Alberta, Canada.

In 2015, I was short-listed for ERC (European Research Council) Starting Grant, 1.4 M€, the most prestigious European academic personal grant. Project assessed as fundable (grade A), not granted due to budget limitations.

During my Fellowship at ETH (2014), I contributed to the successful preparation of a European Advanced Grant (2.5 M€, five years project) submitted by prof. Poulidakos on the topic of icephobicity.

During my early post-doc (2011-2012), I contributed to the successful proposal preparation of a collaborative Italian-Canadian project on icing (total 530'000 €, host institution 279'000 €), funded by Lombardy Region and Québec (SIIRI - Soutien à des initiatives internationales de recherche et d'innovation SIIRI). The collaborative process included Università di Bergamo, Politecnico di Milano and McGill University.

FELLOWSHIPS, AWARDS AND HONORS

2018-2021	Rita Levi Montalcini Fellowship.
2016	Founding member of the Marie Curie Alumni Association – Swiss Chapter.
2013	PhD thesis short-listed by UIT (Italian Termofluids Union) among the 5 best Italian PhD thesis in thermo-fluid dynamics for the years 2011-2012.
2010	Selected for the Youth Talent Festival, category “young researchers” (organized by Youth Italian Minister).
2010	Paul Eisenklam Travel Award for young researchers (1'000 €), from ILASS-Europe 2010 Conference on Liquid Atomization and Spray Systems.
2010	Selected for the 60th Nobel Laureate Meeting in Lindau, Germany, gathering young scientists with Nobel Laureates. Financial support from Foundation Lindau Nobel prize winners Meetings and Cariplo Foundation. http://www.lindau-nobel.org/ .
2008	Scholarship (8'000 €), Cariplo Foundation, to support visiting period at University of Alberta, Canada.
2001-2006	Four annual scholarship (total value 2'400 €), ENASARCO Foundation, for excellent exam records during university studies.

TEACHING EXPERIENCE

from 2020	Principal Lecturer of “Engineered Nanomaterials”, 2 nd year MSc program in Materials Science
from 2019	Lecturer of a 12-hour module in “Physical Chemistry of Solid State and Surfaces”, 1 st year MSc program in Materials Science
2019-2020	Supervision and evaluation of students (3 rd year BSc) during internship in companies (average 3 students/month).
2018-2020	Teaching assistant – Laboratory of analytical chemistry, University of Milano-Bicocca (XRD, TGA).
2011	Teaching assistant – Modelling of Thermo-physics systems, Università degli Studi di Bergamo, Italy (new experimental class with 3 students – responsible for the design of Matlab-based exercises).
2009	Teaching assistant – Thermodynamics and Heat Transfer, Università degli Studi di Bergamo, Italy (~100 students).

SUPERVISORY EXPERIENCE

2018-2021	Supervision of 2 post-docs, 4 PhD students and 5-10 Bsc and Msc thesis/year.
2015-2017	Co-supervision of 1 PhD student (reference tutor: Dr. Tanja Zimmermann), Functional Cellulose Materials, EMPA.
2012-2014	Supervision of 10 BSc and 2 MSc students (reference tutor: Prof. Dimos Poulikakos), Laboratory of Thermodynamics in Emerging Technologies, ETH Zurich, Switzerland.
2008-2013	Supervision of 3 Research assistants (MSc) and 5 MSc students (reference tutor: Prof. Marco Marengo), Thermal Physics Laboratory, Università degli Studi di Bergamo, Italy. Supervision of both research and industrial projects. One thesis was awarded with prize for outstanding dissertation "PoMiLIA-61" (500€), for the most outstanding dissertation of 2012 on the topic "Innovative solutions to save energy in the aerospace sector".

RESEARCH RELATED SERVICES

I have been serving as reviewer for several international journals, including Nature Communications, Nano Letters, Science Advances, Nanomaterials, Advanced Material Interfaces, Coatings, RSC Advanced,

Materials, Soft Matter, Advances in Colloid and Interfacial Science, Colloids and Surfaces A, ACS Applied Materials and Interfaces, Chemistry of Materials, Scientific Reports, ChemPlusChem, Physics of Fluids, Cold Regions Science and Technology. I serve as reviewer for ~15-20 journal papers/year.

MAJOR SCIENTIFIC COLLABORATIONS

2019-2021	Dr. Sabrina Bertini. Chitosan-based films. biochemistry Institute Ronzoni. Italy.
2017-2021	Prof. Marie-Jean Thoraval. Water-in-oil compound drop impact. Xi'an Jiaotong University, China.
2018-2021	Dr. Viviane Lütz-Bueno, Dr. Ana Diaz, scanning SAXS. Paul Scherrer Institute, Switzerland.
2015-2016	Dr. Salomé dos Santos. Viscoelastocapillary effects at water-bitumen interfaces, EMPA. 1 journal paper.
2015-2016	Prof. Ilya Karlin, Contactless drop impact on a sublimating slope – Numerical simulations using entropic lattice Boltzmann method, ETH Zurich. 1 journal paper and 1 conference paper.
2008-2015	Prof. Alidad Amirfazli. Dr. Antonini has been a visiting PhD of the Surface Engineering and Instrumentation Laboratory in 2008 and continued collaboration through continuous student exchange, Department of Mechanical Engineering, University of Alberta, Canada (from 2013 at York University, Canada). 7 journal papers and 1 book chapter.
2013-2014	Dr. Dominique Dominique, Prof. Jan Carmeliet, X-ray investigation of liquid meniscus penetration into superhydrophobic surfaces, EMPA Research Center, Switzerland, and Paul Scherrer Institute, Switzerland. 1 journal paper.
2012-2014	Prof. Manolis Gavaises, Modelling of boundary conditions for unsteady drop impact numerical simulations, School of Engineering and Mathematical Sciences, City University London, UK. 1 journal paper.
2012-2013	Prof. José Palacios, test of ice shedding properties of superhydrophobic surfaces on helicopter blades in icing wind tunnel, Penn State University, Pennsylvania, USA. 1 journal paper.
2012	Dr. Iliia Roisman, Impact of airflow accelerated water drops onto superhydrophobic surfaces, Technische Universität Darmstadt, Germany. 1 journal paper and 1 conference paper.
2011-2012	Prof. Wagdi Habashi, Development of innovative anti-icing systems for aeronautics, McGill University, Montreal, Canada.
2011-2012	Prof. Alberto Guardone, Development of innovative anti-icing systems for aeronautics, Politecnico di Milano, Italy.
2008	Dr. Romain Rioboo, Prof. Joel de Coninck, Micro-drop impact tests, University of Mons, Belgium.

LANGUAGES

Italian	Native
English	Professional, oral and written (C1 level)
German	Very good (B2 level – Zertifikat Deutsch für den Beruf, Goethe Institut, 2006)

SCIENTIFIC PUBLICATIONS

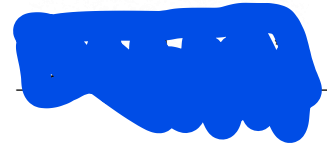
I am the author of 28 peer-review international journal publications (including 5 corresponding authorships), 2 book chapters on anti-icing surfaces, 1 patent, and several conference proceeding and presentations. An up-to-date list of refereed journal publications is available here:

Google Scholar: <http://scholar.google.ch/citations?user=2CKjmrcAAAAJ&hl=en>

Scopus: <http://www.scopus.com/authid/detail.url?authorId=37119842300>

I hereby authorize the use of my personal data in accordance to the GDPR 679/16 - "European regulation on the protection of personal data".

Carlo Antonini

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