

CURRICULUM VITAE - Prof. Marengo Marco - November 2022

PERSONAL INFORMATION

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PRESENT APPOINTMENTS

01.10.2022 - present **Distinguished Professor in Thermal Physics, Department of Civil Engineering and Architecture, University of Pavia, Pavia, Italy**
01.09.2019 – 31.12.2022 Director of the Advanced Engineering Centre - University of Brighton, Brighton, UK
01.01.2019 – 31.12.2022 Chair of the Engineering Division Industrial Advisory Board - University of Brighton, Brighton, UK
01.01.2014 – 31.12.2022 Full Professor of Thermal Engineering – School of Computing, Engineering and Mathematics – University of Brighton, Brighton, UK

OTHER ACADEMIC APPOINTMENTS

22.09.2019 – present Adjunct Professor – York University, Toronto, Canada
01.10.2018 – present Member of the Doctoral College in “Design, Modeling, and Simulation in Engineering”, University of Pavia, Pavia, Italy
01.10.2016 – present Senior Research Fellow at the National Science Foundation of Portugal, Center for Innovation, Technology and Policy Research - IN+, Lisbon
18.03.2021 – 31.12.2022 Full member of the UK *EPSRC Peer Review College*

PREVIOUS APPOINTMENTS

01.07.2017 – 31.08.2019 Chair of the Professoriate Advisory Group of the University of Brighton, University of Brighton, Brighton, UK
01.11.2015 – 30.06.2017 Chair of the College Professoriate Group of the College of Life, Health and Physical Sciences, University of Brighton, Brighton, UK
17.06.2017 – 12.08.2017 Visiting Professor at the Department of Mechanical Engineering, University of Toronto, Toronto, Canada
17.06.2017 – 10.08.2017 Visiting Professor at the Lassonde School of Engineering, York University, Toronto, Canada
15.07.2012 – 30.08.2012 Visiting Professor at the University of Alberta, Edmonton, Canada
01.01.2005 – 31.12.2018 Visiting Professor at the Laboratoire de Physique des Surfaces et Interfaces, University of Mons, Belgium
01.09.2003 – 30.06.2006 Assistant Pro-Vice Chancellor of the University of Bergamo for European Affairs and Projects, Bruxelles, Belgium
01.10.2002 – 30.09.2016 Associate Professor of Thermal Physics – Dept. of Engineering and Applied Sciences – University of Bergamo, Dalmine, Italy
01.10.2002 – 30.06.2005 Co-director of the Experimental Laboratory of Microsystems and Robotics (LSRM) at the Research Centre for Innovation and Technology, Dalmine, Italy
01.07.1998 – 30.09.2002 Assistant Professor of Thermal Physics – Dept. of Industrial Engineering, University of Bergamo, Dalmine, Italy
01.01.1998 – 30.06.1998 Senior Research Fellow - Technische Universitaet Darmstadt, Darmstadt, Germany
01.04.1996 – 31.12.1997 Research Fellow – Lehrstuhl fuer Stromungsmechanik, Erlangen-Nuernberg Universitaet, Erlangen, Germany,

ACADEMIC QUALIFICATIONS

01.10.1993 – 31.03.1996 Ph.D. in Energy Systems, Polytechnic of Milan, Milan, Italy
01.10.1984 – 29.11.1991 B.Sc. and M.Sc. Degree in Physics (cum laude), University of Torino, Torino, Italy. 1 year of civil service from 01.07.1988 to 31.08.1989. 1 year Master Thesis from 01.10.1990 to 29.11.1991

SPECIAL AWARDS, HONOURS AND DISTINCTIONS

20.01.2022 – present	ESA Science Strategist for the SciSpacE Strategy Prioritisation Exercise
21.10.2021 – present	Associate Editor for ASME's new open access journal, the <i>ASME Open Journal of Engineering</i> (AOJE)
29.07.2021 – present	Editorial Board Member of NATURE Scientific Report (IF = 5.133)
01.01.2021 – present	Associate Editor of MDPI Journal Energies (IF = 3.044)
01.01.2020 – present	Review Editor on the Editorial Board of Microgravity - Frontiers
01.01.2019 – present	Associate Editor of International Journal of Multiphase Flows, Elsevier (IF = 3.083) ¹
10.05.2018 – present	Editor-in-Chief of the Section "Thermal Management" of the MDPI Journal Energies (IF = 3.044)
01.10.2016 – present	UK scientific representative in the International Heat Pipe Conference Committee
01.10.2013 – present	Scientific Coordinator of the International Pulsating Heat Pipe Scientific Team for the Thermal Platform on the International Space Station, European Space Agency, The Netherlands
19.06.2004 – present	8 Invited Plenary Lectures in recognised International Conferences (see below)
01.10.2019 – 04.09.2021	Chair of the Scientific Committee of the International Conferences of Liquid Atomization and Spray Systems (ICLASS), Edinburgh, 31 Aug – 4 Sept 2021
01.01.2009 – 31.12.2018	Editor-in-Chief (Europe) of the International Journal "Atomization and Sprays", Begell House Inc., Danbury, Connecticut, U.S.A
01.03.2016 – 30.09.2017	Guest Editor of "Energies" Journal, Advanced Thermal Simulation of Energy Systems, MDPI (IF = 2.702)

1. TEACHING AND LEARNING

I have **28 years of academic career** (1993-2021) which includes teaching and student experience. Still, most of my experience was carried out at the Polytechnic of Milan and University of Bergamo, Italy, for the Courses of Building Engineering, Mechanical Engineering, Computing and Business Engineering. I taught 14 modules of Thermal Physics (B.Sc. level) and 7 modules of Energy Saving in Building and Building Energy Certification (M.Sc. level) as module leader and 22 modules of Thermal Physics and Thermal Plants (B.Sc. level) as contract professor. I have orally examined more than 4000 B.Sc. and M.Sc. students. I have an **extensive experience in teaching for Professional Development and Training**, for example as Director of the "Building Energy Certification" courses, and for the "High Formation of Secondary School Teachers" in Bergamo, Italy. **I have supervised to completion the research projects (Final Year Project for M.Sc. students) of more than 100 Master Degree students, 14 Ph.D. students and 11 Early Stage Researchers.** As Visiting Professor at the University of Mons-Hainaut, Belgium, I taught 5 post-graduate modules of Thermodynamics of Complex Systems and Advanced Heat Transfer. I designed, proposed and organised several professional and research courses, among which the International Advanced Course on the Interface, Drops and Liquid Sprays Physics (LIDESP), now at the 8th edition. I was member of the panel for the Student Curriculum Development for the Engineering Faculty of Bergamo from 1999 to 2004, for the design and implementation of the courses.

From 2019 I am Module Leader for the new modules of Thermofluids, ME558 and ME559, Level 5, at the School of Computing, Engineering and Mathematics.

• All undergraduate and taught postgraduate units (01.09.2014 - present)

2019 – present	Module Leader of Thermofluids, ME558 and ME559, Level 5, B.Sc. in Mechanical, Automotive and Aeronautical Engineering, University of Brighton
2014 – 2019	Module of Fluid Dynamics, ME257, Part II, Module leader: Prof. Sergei Sazhin, B.Sc. in Mechanical, Automotive and Aeronautical Engineering, University of Brighton
2014 – 2016	Module of Advanced Thermodynamics, Ph.D. students, University of Mons, Mons, Belgium. Design, preparation and delivery of a module of 8 hours to 6

¹ <https://www.journals.elsevier.com/international-journal-of-multiphase-flow/editorial-board>

• **Major teaching responsibilities in previous years that have not already been included above.**

I was module leader of the following 21 modules (AY= academic year):

1. Module of Energy Saving in Building and Building Energy Certification, M.Sc. in Building Engineering, University of Bergamo, AY06-07, AY07-08, AY08-09, AY09-10, AY11-12, AY12-13, AY13-14
2. Module of Thermal Physics and Thermal Plants, B.Sc. in Building Engineering, University of Bergamo, AY11-12, AY12-13, AY13-14
3. Module of Thermal Physics, B.Sc. in Computing Engineering, University of Bergamo, AY04-05, AY05-06, AY06-07, AY07-08
4. Module of Thermal Physics, B.Sc. in Business Engineering, University of Bergamo, AY02-03, AY03-04, AY04-05, AY05-06, AY06-07, AY07-08, AY08-09

• **Innovative units or teaching methods introduced by you.**

I designed, proposed and co-organised new **professional** courses (see below the section “Continuing Professional Development teaching”). To note, the course on FEM Modelling was the first one in Italy to propose theoretical insights together with a practical session at the workstations (using commercial codes), both in the mechanical and thermal field. The courses in “Energy Certification of Buildings” gave the chance to more than 200 professionals to obtain the Building Energy Assessment Certificate to carry out Energy Certification of Building. It was the first one of its kind in Italy in 2007, just few months after the introduction of the Italian energy regulation for buildings.

• **Collaborative teaching projects with colleagues in other schools or institutions.**

All of my professional development courses and the lecturing to PhD students have been developed and taught in collaboration with external institutions, such as York University and University of Liverpool (LIDESP), the Building Construction Association (for the Energy Certification of Buildings Course), Polytechnic of Milan (for the Infrared Thermography Techniques Course). The LIDESP course was delivered in Darmstadt (Germany), Tainan (Taiwan), Brighton (UK), Valencia (Spain), Wien (Austria) and Lisbon (Portugal), Changzhou (China) and Lisbon (Portugal). From 2018 I am co-chair of the international workshop “Surface Wettability Effect on Phase Change” (SWEP) together with Prof. Joel De Coninck in Mons, Belgium with 4 editions, 29 plenary lecturers and about 190 participants in total. As Visiting Professor at University of Mons-Hainaut, Belgium, I taught 5 modules of “Thermodynamics of Complex Systems” (AY05-06-07, AY09-10-11-12) to Ph.D. and M.Sc. students in Physics.

• **Major achievements in teaching administration, explaining their importance and significance.**

Apart of being module leader of several modules, I was member of the panel for the Curriculum Development for the Engineering Faculty of Bergamo from 1999 to 2004, member of the Business Engineering School panel for the Curriculum Development from 2004 to 2006 and member of the Building Engineering School panel for the Curriculum Development from 2007 to 2016. Furthermore, I was the Dean Delegate for the admission of foreign students to the Engineering Courses at the University of Bergamo, from 2003 to 2009.

• **Continuing Professional Development teaching which you have led and/or devised.**

April 2019	Co-director of the “Workshop on how to build a Successful Career as a Researcher at an international level”, Jiangsu University of Technology, Changzhou, Jiangsu Province, China, delivering the units about Mentoring and Industrial Liaison.
2007-2009	Proposer and Director of Professional Courses in “Energy Certification of Buildings” at Scuola Edile, Seriate, Italy, with the accreditation of Lombardy Region, Oct 2007 (60 students), Jan 2008 (90 students), Mar 2008 (90 students), Nov 2009 (50 students), two half-days per week for 10 weeks (80h in total).
2007-2009	Co-founder and co-director of the Advanced Course in “Infrared Thermography Techniques for Industrial and Civil Applications”, Polytechnic of Milan, Italy, 3 editions, up to 40 students each course, 3 days, 20 hours
2009-2010	Contract Teaching of Energy Saving, Energetics and Renewable Energies at Craftsman Association, Bergamo, Italy, one edition, 15 students, half a day for 12 weeks
2005-2006	Contract Teaching of Thermal and Fluid Machinery, High Formation of Secondary School Teachers (SILSIS), Bergamo, Italy, one edition, about 90 teachers, 40 hours in

	total
2002-2005	Co-Proposer, Co-director and secretary of the Professional Courses “From design to FEM modelling of structural components”, University of Bergamo, Dalmine, Italy, 30 students each, 4 editions, 3 days, 24 hours
2002-2003	Proposer and trainer of the Professional Course on “Design and writing of European Projects” for the Project NETFORMEC, Industrial Board of Bergamo, Italy, 20 students, 1 full day of training, 7 hours

2. RESEARCH AND ENTERPRISE

My research has been mainly dedicated to the field of thermofluids, both with experimental and modelling activities. The main topics are the physics of droplet and sprays, microfluidics, boiling and two-phase systems, surface wettability and, more recently, passive heat transfer devices, such as heat pipes. I perform at international level (as shown below by **Journal Publications, Editorial roles, Chair of International Conferences, member of editorial boards, organiser of workshops and conferences, reviewers for important journals, expert for European and UK funding institutions**) for all of the topics I worked on in my career. Every time I initiated a new subject, I planned an ambitious strategy in terms of novelty, impact and deliverables. Most of my research is carried out within International collaborations.

I have published more than **330 papers** in total, among which more than **100 are in International peer-reviewed Journal Papers** (from 2014 I published an average of 25.5 papers/yr with 9.3 papers/yr in International Journals). I have written **6 Chapters in books** and I have **5 International patents**.

I am Co-Editor of the Springer Book “Surface Wettability Effects in Phase Changes”, published in November 2021.

Working in the sector of space applications, I took the opportunity to **coordinate experimental tests in microgravity flight campaigns** with the European Space Agency, which led to the selection of my experiment on Pulsating Heat Pipes as one of the three European experiments in physical sciences on the International Space Station in 2024.

My research has been recognised with covers in Journals, such as Physics of Fluids and Langmuir, and with more than **30 invited lectures** around the world, among which **8 were as plenary lectures** in recognised International Conferences. Looking at Google Scholar topic labelling, I am within the **top 5 positions worldwide** for *Thermofluids, Heat Pipes* and *Sprays*.

In April 2019 I started the spin-off company FREDS4BUILDING, specialised in energy simulations of buildings. The company was supported by the University of Brighton, through two funding schemes, i.e. the *Concept Fund* and the *Accelerator Fund*.

(i) Research Outputs (2014-2021)

I have 364 products in Google Scholar in total, 226 research outputs in PURE (among which 105 articles), 138 documents in SCOPUS.

• **95 Journal peer reviewed papers (SCOPUS)**, among which:

1. Gibbons, M.J., **Marengo, M.**, Persoons, T., A review of heat pipe technology for foldable electronic devices, APPLIED THERMAL ENGINEERING, 194, 2021
2. Bernagozzi, M., Georgoulas, A., Miché, N., Rouaud, C., **Marengo, M.**, Novel battery thermal management system for electric vehicles with a loop heat pipe and graphite sheet inserts, APPLIED THERMAL ENGINEERING, 194, 2021
3. Vontas, K., Andredaki, M., Georgoulas, A., Miché, N., **Marengo, M.**, The effect of surface wettability on flow boiling characteristics within microchannels, INT. J. OF HEAT AND MASS TRANSFER, 172, 2021
4. Pagliarini, L., Cattani, L., Bozzoli, F., Mameli, M., Filippeschi, S., Rainieri, S., **Marengo, M.**, Thermal characterization of a multi-turn pulsating heat pipe in microgravity conditions: Statistical approach to the local wall-to-fluid heat flux, INT. J. OF HEAT AND MASS TRANSFER, 169, 2021
5. Der, O., Alqahtani, A.A., **Marengo, M.**, Bertola, V., Characterization of polypropylene pulsating heat stripes: Effects of orientation, heat transfer fluid, and loop geometry, APPLIED THERMAL ENGINEERING, 184, 2021
6. Andredaki, M., Georgoulas, A., Miché, N., **Marengo, M.**, Accelerating Taylor bubbles within circular capillary channels: Break-up mechanisms and regimes, INT. J. OF MULTIPHASE FLOW, 134, 2021
7. Andredaki M., A Georgoulas, **M Marengo**, Numerical investigation of quasi-sessile droplet absorption into wound dressing capillaries, PHYSICS OF FLUIDS, 32 (9), 092112, 2020

8. Fernandez-Toledano J. Carlos, B Braeckeveltdt, **M Marengo**, J De Coninck, How Wettability Controls Nanoprinting, PHYSICAL REVIEW LETTERS, 124 (22), 2020
9. Vontas K., C Boscariol, M Andredaki, A Georgoulas, C Crua, JH Walther, **M. Marengo**, Droplet Impact on Suspended Metallic Meshes: Effects of Wettability, Reynolds and Weber Numbers, FLUIDS, 5 (2), 81, 2020
10. Betancur L., D Mangini, M Mantelli, **M Marengo**, Experimental study of thermal performance in a closed loop pulsating heat pipe with alternating superhydrophobic channels, THERMAL SCIENCE AND ENGINEERING PROGRESS, 17, 100360, 2020
11. Magaletti F., A Georgoulas, **M Marengo**, Unraveling low nucleation temperatures in pool boiling through Fluctuating Hydrodynamics simulations, INTERNATIONAL JOURNAL OF MULTIPHASE FLOW, 103356, 2020
12. Feng C., MJ Gibbons, **M Marengo**, S Chandra, A novel ultra-large flat plate heat pipe manufactured by thermal spray, APPLIED THERMAL ENGINEERING, 171, 115030, 2020
13. Pietrasanta L., M Mamelì, D Mangini, A Georgoulas, N Miche', **M. Marengo**, Developing flow pattern maps for accelerated two-phase capillary flows, EXPERIMENTAL THERMAL AND FLUID SCIENCE, 112, 109981, 2020
14. Perna R., M Abela, M Mamelì, A Mariotti, L Pietrasanta, **M Marengo**, S. Filippeschi, Flow characterization of a pulsating heat pipe through the wavelet analysis of pressure signals, APPLIED THERMAL ENGINEERING, 115128, 2020
15. N Qian, Y Fu, **M Marengo**, J Chen, J Xu, Start-up timing behavior of single-loop oscillating heat pipes based on the second-order dynamic model, INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 147, 118994, 2020
16. N Qian, Y Fu, **M Marengo**, J Xu, J Chen, F Jiang, Heat Transport Capacity of an Axial-Rotating Single-Loop Oscillating Heat Pipe for Abrasive-Milling Tools, ENERGIES, 13 (9), 2145, 2020
17. Mamelì, M.; Piacquadio, S.; Viglione, A.S.; Catarsi, A.; Bartoli, C.; **Marengo, M.**; Di Marco, P.; Filippeschi, S.; Start-Up and Operation of a 3D Hybrid Pulsating Heat Pipe on Board a Sounding Rocket, MICROGRAVITY SCIENCE AND TECHNOLOGY, 1-11, **2019**
18. Cattani, L.; Mangini, D.; Bozzoli, F.; Pietrasanta, L.; Mamelì, M.; Filippeschi, S.; Rainieri, S.; **Marengo, M.**; An original look into pulsating heat pipes: Inverse heat conduction approach for assessing the thermal behaviour, THERMAL SCIENCE AND ENGINEERING PROGRESS, 10, 317-326, **2019**
19. Kang, B; **Marengo, M**; Begg, S; A Study of the Effect of Nanoparticle Concentration on the Characteristics of Nanofluid Sprays, JOURNAL OF APPLIED FLUID MECHANICS, 12, 2, 413-420, **2019**
20. Buksh, S; Almohammadi, H; **Marengo, M**; Amirfazli, A; Spreading of low-viscous liquids on a stationary and a moving surface, EXPERIMENTS IN FLUIDS, 60, 4, 76, **2019**
21. Mamelì M., A. Catarsi, D. Mangini, L. Pietrasanta, N. Miche', **M. Marengo**, P. Di Marco, S. Filippeschi, Start-up in Microgravity and Local Thermodynamic States of a Hybrid Loop Thermosyphon/Pulsating Heat Pipe, APPLIED THERMAL ENGINEERING, 10.1016/j.applthermaleng.2019.113771, **2019**
22. Chen H., Xurui Zhang, Beatriz Defez Garcia, A. Georgoulas, D. Marin, Qingxia Liu, **M. Marengo**, Zhenghe Xu, A. Amirfazli, Drop impact onto a cantilever beam: behaviour of the lamella and force measurement, J. OF INTERFACIAL PHENOMENA AND HEAT TRANSFER, IPHT-30975, **2019**
23. Andredaki M., A. Georgoulas, N. Miche', **M. Marengo**, Numerical investigation of liquid film instabilities and evaporation in confined oscillating slug-plug flows, WIT TRANSACTIONS ON ENGINEERING SCIENCES, Vol. 123, **2019**
24. Chen H., **M. Marengo**, and A. Amirfazli, Drop impact onto semi-infinite solid surfaces with different wettabilities, PHYSICAL REVIEW FLUIDS, Vol. 4(8), doi: 10.1103/PhysRevFluids.4.083601, **2019**
25. Ayel, V.; Araneo, L.; Marzorati, P.; Romestant, C.; Bertin, Y.; **Marengo, M.**; Visualization of flow patterns in closed loop flat plate pulsating heat pipe acting as hybrid Thermosyphons under various gravity levels, HEAT TRANSFER ENGINEERING, 40, 3-4, 227-237, **2019**
26. Boscariol, C., Chandra, S., Sarker, D., Crua, C. and **Marengo, M.**, Drop impact onto attached metallic meshes: liquid penetration and spreading. EXPERIMENTS IN FLUIDS, 59(12), p.189, **2018**
27. Villa, F., **Marengo, M.**, De Coninck, J., A new model to predict the influence of surface temperature on contact angle, NATURE SCIENTIFIC REPORTS, 8 (1), doi: 10.1038/s41598-018-24828-8, **2018**
28. Mangini, D., **Marengo, M.**, Araneo, L., Mamelì, M., Fioriti, D., Filippeschi, S., Infrared analysis of the two-phase flow in a single closed loop pulsating heat pipe, EXPERIMENTAL THERMAL AND FLUID SCIENCE, 97, pp. 304-312, doi: 10.1016/j.expthermflusci.2018.04.018, **2018**

29. Bernagozzi, M., Charmer, S., Georgoulas, A., Malavasi, I., Michè, N., **Marengo, M.**, Lumped parameter network simulation of a Loop Heat Pipe for energy management systems in full electric vehicles, *APPLIED THERMAL ENGINEERING*, 141, pp. 617-629, doi: 10.1016/j.applthermaleng.2018.06.013, **2018**
30. Cecere, A., De Cristofaro, D., Savino, R., Ayel, V., Sole-Agostinelli, T., **Marengo, M.**, Romestant, C., Bertin, Y., Experimental analysis of a Flat Plate Pulsating Heat Pipe with Self-ReWetting Fluids during a parabolic flight campaign, *ACTA ASTRONAUTICA*, 147, pp. 454-461, doi: 10.1016/j.actaastro.2018.03.045, **2018**
31. Bordbar, A., Taassob, A., Khojasteh, D., **Marengo, M.**, Kamali, R., Maximum Spreading and Rebound of a Droplet Impacting onto a Spherical Surface at Low Weber Numbers, *LANGMUIR*, 34 (17), pp. 5149-5158, doi: 10.1021/acs.langmuir.8b00625, **2018**
32. Aboukhedr, M., Georgoulas, A., **Marengo, M.**, Gavaises, M., Vogiatzaki, K., Simulation of micro-flow dynamics at low capillary numbers using adaptive interface compression, *COMPUTERS AND FLUIDS*, 165, pp. 13-32, doi: 10.1016/j.compfluid.2018.01.009, **2018**
33. Ayel, V., Araneo, L., Marzorati, P., Romestant, C., Bertin, Y., **Marengo, M.**, Visualization of Flow Patterns in Closed Loop Flat Plate Pulsating Heat Pipe Acting as Hybrid Thermosyphons under Various Gravity Levels, *HEAT TRANSFER ENGINEERING*, pp. 1-11. doi: 10.1080/01457632.2018.1426244, **2018**
34. Mangini D., Mameli M., Fioriti D., Araneo L., Filippeschi S., **Marengo M.**, Hybrid Pulsating Heat Pipe for Space Applications with Non-Uniform Heating Patterns: Ground and Microgravity Experiments, *APPLIED THERMAL ENGINEERING*, 126, pp. 1029-1043, **2017**, doi: 10.1016/j.applthermaleng.2017.01.035
35. Khojasteh D., A. Bordbar, R. Kamali, **M. Marengo**, Curvature effect on droplet impacting onto hydrophobic and superhydrophobic spheres, *INT. J. OF COMPUTATIONAL FLUID DYNAMICS*, 31(6-8), pp. 310-323, **2017**
36. Georgoulas A., M. Andredaki, **M. Marengo**, An enhanced VOF method coupled with heat transfer and phase change to characterise bubble detachment in saturated pool boiling, *ENERGIES*, 10(3), 272, **2017**
37. Teodori E., P. Pontes, A. Moita, A. Georgoulas, **M. Marengo**, A. Moreira, Sensible heat transfer during droplet cooling: Experimental and Numerical analysis, *ENERGIES*, 10(6), 790, **2017**
38. Teodori E., T. Valente, I. Malavasi, A. Moita, **M. Marengo**, A. Moreira, Effect of extreme wetting scenarios on pool boiling conditions, *APPLIED THERMAL ENGINEERING*, 115, pp. 1424-1437, **2017**
39. Geppert A., A. Terzis, G. Lamanna, **M. Marengo**, B. Weigand, A benchmark study for the crown-type splashing dynamics of two-component droplet-wall film interactions, *EXPERIMENTS IN FLUIDS*, 58: 172, **2017**, doi: 10.1007/s00348-017-2447-2
40. Koukouvinis P., M. Gavaises, A. Georgoulas, **M. Marengo**, Compressible simulations of bubble dynamics with central-upwind schemes, *INT. J. OF COMP. FLUID DYNAMICS*, 30(2), pp. 129-140, **2016**
41. Malavasi I., F. Veronesi, A. Caldarelli, M. Zani, M. Raimondo, **M. Marengo**, Is a Knowledge of Surface Topology and Contact Angles Enough to Define the Drop Impact Outcome?, *LANGMUIR*, 32(25), pp. 6255–6262, **2016**, doi: 10.1021/acs.langmuir.6b01117
42. Manzoni M., M. Mameli, C. de Falco, L. Araneo, S. Filippeschi, **M. Marengo**, Non-equilibrium lumped parameter model for Pulsating Heat Pipes: validation in normal and hyper-gravity conditions, *INT. J. HEAT AND MASS TRANSFER*, 97, pp. 473-485, **2016**
43. Antonini C., S. Jung, A. Wetzel, E. Heer, P. Schoch, M. Ali Mazloomi, Shyam S. Chikatamarla, I. Karlin, **M. Marengo**, D. Poulikakos, Contactless prompt tumbling-rebound of drops from a sublimating slope, *PHYS. REV. FLUIDS*, 1, pp. 013903-013914, **2016**, doi: 10.1103/PhysRevFluids.1.013903
44. Manzoni, M., Mameli, M., de Falco, C., Araneo, L., Filippeschi, S., and **Marengo, M.**, Advanced numerical method for a thermally induced slug flow: application to a capillary closed loop pulsating heat pipe. *INT. J. NUMER. METH. FLUIDS*, 82, pp. 375–397, **2016**, doi: 10.1002/fld.4222
45. Mameli M., Mangini, D., Vanoli, G.T., Araneo, L., Filippeschi, S., **Marengo, M.**, Advanced multi-evaporator loop thermosiphon, *ENERGY*, 112, pp. 562-573, **2016**, doi: 10.1016/j.energy.2016.06.074.

• Chapters in Edited Books

1. Malavasi I., E. Teodori, A.S. Moita, A.L.N. Moreira, M. Marengo, Wettability effect on pool boiling: a review, *Encyclopaedia of Two-Phase Heat Transfer and Flows*, Vol. 3, Ed: J. Thome, World Scientific Publishing Company, Singapore, ISBN 9789813234369

2. V. S. Nikolayev, M. Marengo (2018) Pulsating heat pipes: basics of functioning and numerical modelling, In: Thome, John R., ed. Encyclopedia of Two-Phase Heat Transfer and Flows, Vol. IV. World Scientific Publishing Company, Singapore. ISBN 9789813234369
3. M. Marengo, V. S. Nikolayev (2018) Pulsating heat pipes: experimental analysis, design and applications, In: Thome, John R., ed. Encyclopedia of Two-Phase Heat Transfer and Flows, Vol. IV. World Scientific Publishing Company, Singapore. ISBN 9789813234369

• **Conference Contributions (refereed)**

From 2014, I submitted more than 80 papers in conferences, among which 43 Peer-reviewed Conference papers (SCOPUS), mostly related to thermal management in space, heat pipes and boiling. In my opinion, the best conference contributions are:

1. M Bernagozzi, A Georgoulas, N Miche', C Rouaud, **M Marengo**, A Novel Loop Heat Pipe Based Cooling System for Battery Packs in Electric Vehicles, 2020 IEEE Transportation Electrification Conference & Expo (ITEC), 251-256, 2020
2. Picco M., **M Marengo**, A Fast Response Performance Simulation Screening Tool in Support Of Early Stage Building Design, Proceedings of Building Simulation 2019: 16th Conference of IBPSA, 1296-1303, 2020
3. Andredaki, M., Vontas, K., Georgoulas, A., Miche, N. & **Marengo, M.**, Wettability Effect On Flow Boiling Characteristics Within Micro- passages, 14 Oct 2020, Proc. 5th World Congress On Momentum, Heat And Mass Transfer (MHMT'20), Lisbon, Portugal
4. Andredaki, M., Vontas, K., Georgoulas, A., Miche, N. & **Marengo, M.**, Effect of Channel Aspect Ratio on Flow Boiling Characteristics within Rectangular Micro-passages, 14 Oct 2020, Proc. 5th World Congress On Momentum, Heat And Mass Transfer (MHMT'20). Lisbon, Portugal
5. Zamparini L., D. Mangini, L. Cattani, M. Mameli, N. Miche', F. Bozzoli, S. Filippeschi, **M. Marengo**, Inverse heat transfer analysis of a Pulsating Heat Pipe for space applications tested on board a parabolic flight, 10th Int. Conf. on Multiphase Flow, ICMF 2019, Rio de Janeiro, Brazil, May 19 - 24, **2019**
6. Perna R., M. Mameli, L. Pietrasanta, **M. Marengo**, S. Filippeschi, Time-Frequency Analysis of a Thermally Induced Pulsating Slug Flow, 10th Int. Conf. on Multiphase Flow, ICMF 2019, Rio de Janeiro, Brazil, May 19 - 24, **2019**
7. Vontas K., Boscarior C., Andredaki M., Georgoulas A., Walther J.H., **Marengo M.**, Numerical Investigation of Droplet Impact on Metallic Meshes, 10th Int. Conf. on Multiphase Flow, ICMF 2019, Rio de Janeiro, Brazil, May 19 - 24, **2019**
8. Braeckveldt B., **M. Marengo**, J. De Coninck, Impact of nanodrops on smooth surfaces with various wettabilities: splash phenomena and film dewetting, ILASS-Europe 2019, 29th Conference on Liquid Atomization and Spray Systems, 2-4 September **2019**, Paris, France
9. C. Feng, M. Gibbons, **M. Marengo**, S. Chandra, A Flat Plate Heat Pipe Made With a Thermal Spray Process, The 2nd Pacific Rim Thermal Engineering Conference (PRTEC2019), 13-17 December **2019**, Maui, Hawaii, USA
10. Perna R., M. Mameli, A. Mariotti, L. Pietrasanta, **M. Marengo**, S. Filippeschi, Wavelet Analysis of the Pressure Signal in a Pulsating Heat Pipe, 37th UIT Heat Transfer Conference, Padova, 24-26 June **2019**
11. M. Andredaki, A. Georgoulas, N. Miche, **M. Marengo**, Evaluation of the effect of flow oscillations on the heat transfer coefficient and the liquid film instabilities, for isolated vapour slugs within mini-channels, utilising advanced VOF simulations. Proc. of Joint 19th IHPC and 13th IHPS, Pisa, Italy, June 10-14, **2018**.
12. D. Mangini, L. Pietrasanta, N. Miche', A. Georgoulas, M. Andredaki, **M. Marengo**, A Single Loop Pulsating Heat Pipe in varying gravity conditions: experimental results and numerical simulations. Proc. of International Heat Transfer Conference, Beijing, China, August **2018**
13. M. Andredaki, A. Georgoulas, D. Mangini, L. Araneo, L. Pietrasanta, N. Miche', **M. Marengo**, Computational study on break-up mechanisms of isolated vapour slugs during saturated flow boiling conditions. Proc. of International Heat Transfer Conference, Beijing, China, August **2018**
14. E. Teodori, M. Andredaki, A. Georgoulas, A. Moita, A. Moreira, **M. Marengo**, Enhanced VOF-based direct numerical simulations of slug flow boiling within micro-channels with smooth and finned heated walls. Proc. of International Heat Transfer Conference, Beijing, China, August **2018**
15. M. Andredaki, F. Villa, A. Georgoulas, J. De Coninck, **M. Marengo**, Numerical Investigation of isolated bubble growth and detachment in cases of pool boiling with different wettability characteristics: Implementation of a dynamic contact angle treatment in OpenFOAM. 10th International Conference on Boiling and Condensation Heat Transfer (ICBCHT2018), Nagasaki, Japan, 12th - 15th March **2018**

16. M. Andredaki, A. Georgoulas, N. Miche, E. Teodori, A. Moita, A. Moreira, **M. Marengo**, Numerical investigation of oscillating vapour slugs within heated microchannels in saturated flow boiling conditions, 5th European Conference on MicroFluidics 2018, Strasbourg, France, 28th Feb - 2nd March **2018**
17. Mantelli M.B.H., Tiago W. Uhlmann, Luis H.R. Cisterna, **M. Marengo**, P. Eskilson, Experimental Study of a Sodium Two-Phase Thermosyphon, 9th World Conference on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics, 12-15 June, **2017**, Iguazu Falls, Brazil.
18. Teodori E., P. Pontes, A. S. Moita, A. L. N. Moreira, A. Georgoulas, **M. Marengo**, Experimental and Numerical Study on Sensible Heat Transfer at Droplet/Wall Interactions, 28th Conf. on Liquid Atomization and Spray Systems, 6-8 September **2017**, Valencia, Spain.
19. Aboukhedr M., N. Mitroglou, A. Georgoulas, **M. Marengo**, M. Gavaises, K. Vogiatzaki, Simulation of droplet spreading on real 3D micro - CT images of porous media using the volume-of-fluid method, 28th Conf. on Liquid Atomization and Spray Systems, 6-8 September **2017**, Valencia, Spain.
20. Villa F., **M. Marengo**, P. Di Marco, J. De Coninck, Equilibrium Contact Angle at Boiling Condition, 27th Annual Conference on Liquid Atomization and Spray Systems, 4-7 September **2016**, Brighton, UK.

• Professional Journal Papers

1. Beltrami A., M. Picco, **M. Marengo**, Rapid Exploitation of Building Energy Design Through Compact TRNSYS Modeling, AICARR Journal, 37, 60-67, **2016**

(ii) Evidence of impact of research

My research was always strongly oriented in the direction of innovation and applications, trying to combine blue-sky research with a final product. In this way, seven research proposals led to industrial patents, and at least three research projects led to breakthrough results, such as one about the influence of surface wettability on phase change phenomena, the icing mitigation technique², the new concept of SpacePHP. During my career I was granted with 47 grants for a total of more than £4M³.

• Citations and h-index

SCOPUS: Citations 5111, **h-index 37**, 214 co-authors
 GOOGLE SCHOLAR: Citations 7662, **h-index 41**, **i10-index 82**

RUNNING GRANTS (listed by increasing expire date)

1. ESA MAP TOPDESS, PI, 01.10.2019-30.06.2023, £65k
2. RICARDO BATTERY COOLING project, Supervisor, 01.01.2019-31.12.2021, £64k
3. ESA uGRAPH, Co-I, 01.10.2019-30.09.2021, £0k
4. ESA ISS Pulsating Heat Pipes experiment – Phase C/D for the Heat Transfer Host 1, 01.10.2014 – 31.12.2025, PI, £0k
5. ESA MAP WHISKIES, PI, 01.08.2020 – 31.07.2023, £15k
6. ESA MAP ENCOM4, Co-I, 01.09.2020 – 31.08.2023, £34k
7. i3MED project, PI, 01.04.2020 – 31.08.2023, £455k

PAST GRANTS @University of Brighton

Role	Funder	Scheme	Year	Title	Duration (yr)	Total budget	UoB Budget
Co-PI	European Space Agency	MAP	2015	Innovative Wickless Heat Pipe Systems for Ground and Space Applications	3	973,832	889,680
Co-PI	KTP	KTP	2015	The CHP Bureau	2	136,793	136,793
PI	University of Brighton	Scheme A	2015	The physics of droplet impact on complex surfaces	3	66,000	66,000

² Tang G., Yeong Y.H., Khudiyakov M. (2017) Ice Release Coatings of High Durability for Aerospace Applications. In: Advances in Polymer Science. Springer, Berlin, Heidelberg, cites our results as a milestone of the field

³ Exchange rate of 1.2€/£

Co-PI	European Space Agency	MAP	2016	Enhanced COndensers in Microgravity	3	1,706,722	38,549
Co-PI	INNOVATE UK	INNOVATE UK	2016	LOOP Heat Pump Circuit (LOOPER)	2	121,760	103,203
PI	EPSRC	Open Grant	2017	Novel Hybrid Heat Pipes For Space And Ground Applications (HyHP)	3	892,749	722,000
PI	University of Brighton	Concept fund	2018	Fast early-stage simulator of energy consumption and comfort in buildings	<1		21,000
PI	University of Brighton	Accelerator fund	2019	Fast early-stage simulator of energy consumption and comfort in buildings	<1		20,000
PI	University of Brighton	CMRD - Small research projects	2018	A new bio-microfluidic organoid culture device for biomedical applications	<1		10,000
PI	KTP	KTP	2019	Fabrication of a LHP for intermediate temperature range, European Thermodynamics Ltd	2	186,189	186,189
Supervisor	European Community	Marie Curie IF grant	2019	BOIL-MODE-ON	2	164,500	164,500
Supervisor	UKRI	World Class Laboratory	2020	Climatic Environmental Chamber	<1	215,000	215,000

Two projects has been recently awarded and will start in 2022

PI	LEVERHULME	Standard Grant	2022	AMUsE on Diffuse Interface Simulations of Nucleation (01.01.2022 – 30.06.2025)	3.5	408,507	408,507
Supervisor	European Community	Marie Curie IF GLOBAL grant	2022	Marie Curie H2020-MSCA-IF SurfProHeat project by Dr. Manuel Auliano (01.09.2022 – 30.08.2024).	2	233,000	233,000

(iii) Indications of External Recognition

Conference Chairs

2021 – **Chair of the Scientific Program of the International Conference of Liquid Atomization and Spray Systems (ICLASS)**, Edinburgh, 29 Ago - 2 Sept 2021.

2019 – **Co-chair of the first International Symposium on Oscillating/Pulsating Heat Pipes (ISOPHP)** in Dajeong, Korea, 25-28 September 2019.

2018 - Proponent and Co-chair of the International Workshop “Surface Wettability Effect on Phase Change” (SWEP) – 3 Editions – the next workshop will be held in Brighton in October 2021.

2016 - Chair of the Organisation Program of the European Conference of Liquid Atomization and Spray Systems (ILASS), Brighton, 04 Sept – 07 Sept 2016.

• Invitations to advise on a national or international level

1. Reviewer of five collaborative EPSRC projects, UK in 2017, 2019, 2020, **2021**
2. Reviewer Fonds National de la Recherche Luxembourg. 2020, **2021**
3. Reviewer of research proposals for the Research Promotion Foundation, Cyprus, 2017, **2020**
4. Reviewer for National Science Centre, Funding Scheme PRELUDIUM, Poland, **2020**
5. Expert/reviewer for **European Commission, Bruxelles**, for the Programs

- a. Clean Sky-2 2017 (H2020) – 2 proposals
 - b. ERC STARTING GRANT 2016 (H2020) – 2 proposals
 - c. Clean Sky-2 2016 (H2020) – 2 calls with a total of 5 proposals
 - d. COMPET-1 2015 (H2020) – 2 proposals
 - e. COMPET-4 2015 (H2020) – 4 proposals
 - f. ITN – SPACE 2013 (FP7) – 2 proposals
 - g. ITN – SPACE 2012 (FP7) – 6 proposals
6. Reviewer of research proposals for the National Centre of Science and Technology Evaluation, Kazakhstan, 11 November 2017
7. Reviewer of research proposals for the Natural Science and Engineering Research Council of Canada, Collaborative Research and Development Grant, Committee 096, 20 August 2015
8. Reviewer of a starting grant for the Israeli Foundation, Israel, 26 April 2012

• **PhD Final Exams⁴:**

1. *Maksym Slobodeniuk, TITLE TBD, Poitiers, France, 16 Dec 2021*
2. *Alireza Sarmadian, Thermal Management of Heat-Generating Automotive Powertrain Hardware using Spray Evaporative Cooling, University of Sussex, Brighton, 28 Jul 2021*
3. *Patel Niravkumar Mukundbhai, Investigations on a Novel Liquid Cooled Minichannel Heat Sink, Department Of Mechanical Engineering Sardar Vallabhbhai National Institute Of Technology Surat, Gujarat, India, 22 Mar 2021*
4. *Michael Grizen, Nanoengineering Surfaces for Anti-Icing, University College London, London, 22 Jul 2020*
5. *C. Senthil Kumar, Experimental studies on effect of fill ratio, inclinations and coating on the transient and steady state behaviour of wickless heat pipe, Anna University, Chennai, India, 21 Oct 2019*
6. *María Asunción Barba Higuera, Study of Meter-scale Horizontal Cryogenic Pulsating Heat Pipes, Université Paris-Saclay, CEA/Irfu/DACM, Paris, France, 10 Sept 2019*
7. *Chen Feng, Fabrication of Thermal Management Devices Using Thermal Spray Technology, Faculty of Graduate Studies through Mechanical & Industrial Engineering, University of Toronto, Toronto, Ontario, Canada, 30 July 2019*
8. *Maria Kittel, Drop Impact onto a Wall Wetted by a Thin Film of Another Liquid, Technischen Universität Darmstadt, Darmstadt, Germany, 13 June 2019*
9. *Patel Vipulkumar Maheshbhai, Investigations on a Closed Loop Pulsating Heat Pipe, Department of Mechanical Engineering, S V National Institute of Technology, Surat, Gujarat, India, 12 June 2019*
10. *Manuel Auliano, Controlling droplet cooling with micro/nano-structured surfaces, Norwegian University of Science and Technology, Department of Energy and Process Engineering, Trondheim, Norway, 22 January 2019*
11. *Vyas Srinivasan, Thermo-Hydrodynamics of Isolated Taylor Liquid Plugs, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur, India, 2 July 2018*
12. *Behnam Rostami, Experimental Analysis of Droplet Generation in Presence of Newtonian And Non-Newtonian Flows Within Micro-junctions, PhD Course in Mechanics and Advanced Engineering Sciences (DIMSAI), University of Bologna, Italy, 18 December 2017*
13. *Simeng Chen, An experimental investigation of drop impact phenomena with complex fluids on heated and soft surfaces, University of Liverpool, UK, 5 October 2017*
14. *Nadia Ndamuso, Parametric Studies of Cavitation Dependence on Hydrocarbon and Biodiesel Fuel Injection flows, City University, London, UK, 27 April 2017*
15. *PhD Panel, 3 PhD Candidates, Doctoral School in Science and Technology of Innovative Materials, University of Parma, Italy, 17 March 2017*
16. *Visakh Vaikuntanathan, Experimental and Theoretical Studies of Liquid Drop Impact on Solid Surfaces Comprising Smooth and Texture Portions, India Institute of Science, Bangalore, India, 21 December 2015*
17. *Muhammad Israr, Temporal and Spatial Characterization of Slug Flow in Pipelines Using a Simultaneous PIV-LIF Technique, Information Resource Centre of Universiti Teknologi Petronas (UTP), Bandar Seri Iskandar, Perak, Malaysia, 29 September 2015*
18. *Mansour Al Qubeissi, Heating and evaporation of automotive fuel droplets, University of Brighton, Brighton, UK, 31 July 2015*
19. *Viktor Grishaev, Impact of particle-laden drops on substrates with various wettability, Université*

⁴ In Italic, the exams where I join the oral examination (PhD ViVa). The other exams have been carried out in remote.

Libre De Bruxelles, École Polytechnique De Bruxelles, Bruxelles, Belgium, 9 April 2015

20. PhD Panel, 3 PhD Candidates, Doctoral School in Industrial Engineering, University of Padova, Italy, 15 April **2014**
21. *Davood Kalantari, Characterization of liquid spray impact onto walls and films, Faculty of Mechanical Engineering, Darmstadt University of Technology, Germany, 10 November 2006*
22. *Kai Heukelbach, Untersuchung zum Einfluss der Düseninnenströmung auf die Stabilität von flächigen Flüssigkeitsstrahlen, Faculty of Mechanical Engineering, Darmstadt University of Technology, Germany, 6 April 2003*

- **Invited lectures (from 2014)**

1. University of Pavia, Department of Civil Engineering and Architecture, Italy, 19 October **2021**
2. University of Nottingham, Fluids and Thermal Engineering Research Group, Nottingham, UK, 23 January **2020**
3. University La Sorbonne, Seminars Institut Jean le Rond d'Alembert, Paris, France, 28th March **2019**
4. University of Warwick, Seminar at the School of Engineering, UK, 30th January **2019**
5. University of Florence, Seminar of the Engineering Department, Florence, Italy, 5th October **2018**
6. University of Southampton, AFM seminar, Southampton, UK, 13th December **2017**
7. Sussex University, Engineering Division, Brighton, UK, 27th September **2017**
8. University of Toronto, Mechanical Engineering Dept., Toronto, Canada, 26th July **2017**
9. York University, Lassonde School of Engineering, Toronto, Canada, 10th July **2017**
10. Instituto Superior Tecnico, E+ Center for Innovation, Technology and Policy Research - IN+, Lisbon, Portugal, 30th October **2016**
11. University of Strathclyde, Division of Mathematics, Glasgow, UK, 23th February **2016**
12. UK SPACE AGENCY, ELIPS Community Meeting, London, UK, 24th November **2015**
13. Institut für Thermodynamik der Luft- und Raumfahrt, University of Stuttgart, Germany, 20th April **2015**
14. KAIST, Department of Mechanical Engineering, Daejeon, Korea, 28th August **2015**
15. University of York, Lassonde Mechanical Engineering, Toronto, Canada, 28th October **2015**
16. University of Toronto, MIE Distinguished Lectures, Toronto, Canada, 30th October **2015**
17. POLIEFUN, Polytechnic of Milan, Milan, Italy, 11th September **2014**

- **Plenary lectures at International Conferences**

- | | |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 27-29 December 2021 | M. Marengo , M. Bernagozzi, ...
48th National Conference on Fluid Mechanics And Fluid Power (FMFP 2021) (remote), Bits Pilani, Pilani Campus, Rj, India |
| 17-20 December 2021 | M. Marengo , F. Magaletti, A. Georgoulas, Diffuse Interface modeling coupled with Fluctuating Hydrodynamics Theory for simulation of vapour nucleation, International Heat & Mass Transfer Conference (remote), Mumbai, India |
| 28-29 November 2019 | M. Marengo , Pulsating Heat Pipes for terrestrial and space applications, 11th International Electronics Cooling Technology Workshop (CTW2019), Songshan Lake, Dongguan, China, Co-organized by Division of Technological Sciences, Chinese Academy of Sciences & Huawei Technologies Co., Ltd. |
| 3-8 February 2019 | M. Marengo , C. Antonini, Understanding Surface Wettability Effects on Ice Formation, Micro and Nanoscale Phase Change Heat Transfer, Gordon Research Conference, Barga, Lucca, Italy |
| 20-21 July 2015 | M. Marengo , M. Manzoni, D. Mangini, M. Mameli, L. Araneo, S. Filippeschi, Closed Loop Pulsating Heat Pipes at Variable Gravity Levels, 2 nd International Conference on Heat Transfer and Fluid Flow (HTFF), Barcelona, Spain |
| 20-24 May 2012 | M. Marengo , M. Mameli, S. Khandekar, Towards Quantitative Validation of a Closed Loop Pulsating Heat Pipe Numerical Model, 16th International Heat Pipe Conference, INSA, Lyon, France |
| 5-7 Sept 2005 | M. Marengo , G.E. Cossali, M. Santini, Effects of wall effusivity on secondary droplet atomisation from single and multiple drop impact onto heated surfaces, Proc. of 20 th ILASS Europe Conference, Orleans, France |
| 5-10 June 2005 | M. Marengo , G.E. Cossali, M. Santini, Single and multiple drop impact |

onto heated surfaces, International Symposium on Heat and Mass Transfer in Spray Systems, Antalya, Turkey

17-19 June 2004

M. Marengo, S. Zhdanov, L. Chignoli, G.E. Cossali, Micro-Heat-Sinks for Space Applications, Proceedings of the Second International Conference on Microchannels and Minichannels (ICMM2004), Rochester, New York, USA

I managed experiments for 6 Parabolic Flight Campaigns for the European Space Agency and I was directly involved in another **15 microgravity experiments** in Parabolic Flight and Sounding Rocket campaigns:

Microgravity Platforms and Parabolic Flight Campaigns (from 2007)

1. **2021** - Deployable polymeric PHPs for space application: effect of microgravity and shape change on the thermal performance, ESA MAP TOPDESS, 77th ESA Parabolic Flight Campaign - Brighton, **Nicolas Miché' (PI)**, Marco Marengo (University of Brighton), Francois Clemens (University of Brighton), Volfango Bertola (University of Liverpool), Ali Alqahtani (University of Liverpool), Fabio Bozzoli (University of Parma), Luca Cattani (University of Parma)
2. **2020** - μ COFFeE - Microgravity Capillary Oscillating Flow Experiment, Ground Facilities, Drop Tower Bremen • ID: 9854 (performed the 1st time), S. Pietrowicz, A. Nowak, M. Marengo, L. Pietrasanta
3. **2019** - Capillary jet loop at varying gravity levels, 72nd ESA Parabolic Flight Campaign - POLIMI, **Lucio Araneo (PI)**, Marco Marengo (University of Brighton), Riccardo Clavenna (Polimi), Nicolas Miché (University of Brighton), Olivier de Laet (Calyos), Vincent Dupont (Calyos), Marie Emery (Calyos), Riadh Boubaker (Calyos)
4. **2019** - ESA Fly-Your-Thesis: PHP³, 72nd ESA Parabolic Flight Campaign - Brighton, **Nicolas Miché (Supervisor)**, Liam Ardagh (Brighton - student), Georgie Crewdson (Brighton - student), Alex Evans (Brighton - student), Matteo Pontecorvo (Brighton - student), Thomas Critchley (Brighton - student), Nicolas Miché (Brighton), Brighton FYT free float
5. **2019** - Study of a Pulsating Heat Pipe under a varying gravity force, ESA MAP INWIP, 71st ESA Parabolic Flight Campaign - ENSMA - Poitiers, **Vincent Ayel (PI)**, Vincent Ayel (ENSMA), Cyril Romestant (ENSMA), Nicolas Miché (Brighton), Remi Bertossi (IPSA - Paris), Maksym Slobodeniuk (ENSMA), André Piteau (ENSMA), Jean Carl Rousseau (ENSMA), Poitiers
6. **2018** - Thermo-hydraulic and infrared characterization of flat plate pulsating heat pipe for space application, ESA MAP INWIP, 69th ESA Parabolic Flight Campaign - ENSMA - Poitiers, **Vincent Ayel (PI)**, Nicolas Chauris (ENSMA), Nicolas Miché (Brighton), Marco Marengo (Brighton), Cyril Romestant (ENSMA), Gildas Lalizel (ENSMA), Jean-Christophe Fraudeau (ENSMA), Lucio Araneo (Polimi), Poitiers
7. **2017** - Experimental characterization of a Single Loop Pulsating Heat Pipe with IR analysis, ESA MAP INWIP, 68th ESA Parabolic Flight Campaign • ID: 9582 in collaboration with University of Pisa and Polytechnic of Milan, **M. Marengo (PI)**, L. Araneo (POLIMI), D. Mangini (Brighton), M. Bernagozzi (Brighton), L. Pietrasanta (Brighton), M. Pozzoni (Brighton), M. Palermo (Brighton), L. Jackson (UKSA)
8. **2017** - Space Pulsating Heat Pipe in ISS Heat Transfer Host configuration, ESA MAP INWIP, 67th ESA Parabolic Flight Campaign - Pisa, **Sauro Filippeschi (PI)**, Mauro Mameli (Pisa), Sauro Filippeschi (Pisa), andrea Catarsi (Pisa), Marco LaForesta (AAVID Thermalloy), Marco Marengo (Brighton), Nicolas Miché (Brighton), Daniele Mangini (Brighton), Luca Pietrasanta (Brighton), Marco Bernagozzi (Brighton), Matteo Pozzoni (Bergamo), Brighton
9. **2017** - Self-Rewetting liquid vein stability - SELF-rewetting fluids for ENERGY management SELENE, 66th ESA Parabolic Flight Campaign, Free University of Bruxelles (ULB), **M. Marengo (PI)** (University of Brighton), N. Miché (University of Brighton), M. Bernagozzi (University of Brighton), L. Pietrasanta (University of Brighton), R. Chambers (University of Brighton), M. Palermo (University of Brighton), S. Van Vaerenbergh (ULB), P. Queeckers (ULB), W. Tzevelecos (ULB)
10. **2017** - Thermo-hydraulics characterisation of a single-loop pulsating heat pipe in a variable gravity regime, ESA MAP INWIP, 66th ESA Parabolic Flight Campaign, University of Brighton, in collaboration with University of Pisa, Polytechnic of Milan, University of Bergamo, **M. Marengo (PI)** (University of Brighton), L. Araneo, D. Mangini (University of Bergamo), A. Ilinca (University of Bergamo), M. Mameli (University of Pisa), D. Fioriti (University of Pisa), S. Filippeschi (University of Pisa)
11. **2013** - Thermo-hydraulics characterisation of a pulsating heat pipe in a variable gravity regime,

- 59th ESA Parabolic Flight Campaign, University of Bergamo, University of Pisa, Polytechnic of Milan, **M. Marengo (PI)** (University of Bergamo), L. Araneo (POLIMI), M. Mameli (University of Bergamo), M. Manzoni (University of Bergamo), L. Marelli (POLIMI)
12. **2013** - Thermo-Hydraulics Characterisation of a Pulsating Heat Pipe in a variable Gravity Regime, 58th ESA Parabolic Flight Campaign, University of Bergamo, in collaboration with University of Pisa, Polytechnic of Milan, **M. Marengo (PI)** (University of Bergamo), L. Araneo (POLIMI), M. Mameli (University of Bergamo), S. Filippeschi (University of Pisa), R. Testa (University of Bergamo), L. Marelli (POLIMI)
 13. **2011** - Stratified flows, contact line dynamics, boiling and condensation in microgravity, 55th ESA Parabolic Flight Campaign • ID: 9319 (performed the 1st time), O. Kabov, M. Marengo, L. Araneo, S. Chikov, P. Queeckers, V. Cheverda, D. Zaytsev, V. Grishaev, L. Valdarno
 14. **2010** - Boiling incipience and rivulet/droplet dynamics in microgravity, 53rd ESA Parabolic Flight Campaign • ID: 9251 (performed the 1st time), O. Kabov, M. Marengo, J.C. Legros, S. Chikov, P. Queeckers, D. Zaytsev, R. Rioboo, L. Aranio, V. Cheverda, A. Gluschuk, F. Biondi, V. Grishaev, M. Mameli
 15. **2010** - Boiling incipience and rivulet/droplet dynamics in microgravity (SAFIR experiment), 52nd ESA Parabolic Flight Campaign • ID: 9149 (performed the 1st time), O. Kabov, J.C. Legros, J. De Coninck, M. Marengo
 16. **2007** - Test of drop generator for the DOLFIN project, 47th ESA Parabolic Flight Campaign • ID: 9029 (performed the 1st time), M. Santini, M. Marengo, G.E. Cossali, M. Sforza

Moreover, I was the Scientific tutor of ESA Educational SOUNDING ROCKET - REXUS program PHOS and U_PHOS with the European Space Agency in collaboration with the University of Pisa. Sounding Rocket launches: April 2015 – April 2017. I was involved in the Sounding Rocket campaign of the Brazilian Space Agency, and I supported the design, construction and launch of an innovative Pulsating Heat Pipe with hydrophilic and superhydrophobic patterns, in collaboration with the Federal University of Santa Catarina, Brazil – Launch: 11 November 2016. In 2019 I have actively collaborated with the student team for the ESA Educational FLY-YOUR-THESIS – PARABOLIC FLIGHT of University of Brighton, supervised by Nicholas Miche'. Parabolic Flight Campaign: November 2019.

(iv) Postgraduate Research (PGR) Doctorate Student Supervision

Current

1. Marco Bernagozzi, University of Brighton, 1st supervisor, End date: 31.12.2021
2. Nick Applin, University of Brighton, 2nd supervisor, End date: 30.4.2022
3. Kostas Vontas, University of Brighton, 2nd supervisor, End date: 30.4.2022
4. Giordana Peregrino, University of Brighton, 1st supervisor, End date: 31.08.2023
5. Francois Clemens, University of Brighton, 2nd supervisor, End date: 14.12.2023

Past

1. Dario Fusco, Il Digitale per abbattere le barriere del mercato dell'efficienza energetica: digital marketing, BIM e Building Automation, 30.07.**2020**, University of Bergamo, 1st supervisor
2. Cristina Boscariol, The physics of drop impact onto complex surfaces, 20.12.**2018**, University of Brighton, UK, 1st supervisor
3. Luca Pietrasanta, Experimental analysis of two-phase flows in the context of Pulsating Heat Pipe for space applications, 12.12.**2018**, University of Brighton, UK, 1st supervisor
4. Daniele Mangini, Hybrid Thermosyphon/Pulsating Heat Pipe for Ground and Space Applications. A novel two-phase passive heat transfer device, 10.05.**2017**, University of Bergamo, Italy, 1st supervisor
5. Fabio Villa, Effect of Wettability on Phase Change Phenomena, 24.05.**2017**, University of Bergamo, Italy, 1st supervisor
6. Miriam Manzoni, Design of Pulsating Heat Pipes. A novel non-equilibrium lumped parameter model for transient gravity levels, 14.10.**2016**, University of Bergamo, Italy, 1st supervisor
7. Ileana Malavasi, Wettability Effects on Interface Dynamics and Phase-Change, 14.10.**2016**, University of Bergamo, Italy, 1st supervisor
8. Alberto Beltrami, TRNSYS Integrated Modeling Support Tool for a Fast Building-Plant System Design, 14.10.**2016**, University of Bergamo, Italy, 1st supervisor
9. Benoit Bourdon, Influence of the wettability on the pool boiling onset, 17.4.**2015**, University of Mons, Belgium, 2nd supervisor
10. Marco Picco, Dynamic Energy Simulation Toward Integrated Design of Non-Residential Buildings.

- Model description simplifications and their impact on simulation results, 22.05.2014, University of Bergamo, Italy, 1st supervisor
11. Annamaria Belleri, Integrated Design Methods for Natural Ventilation, 22.05.2014, University of Bergamo, Italy, 1st supervisor
 12. Chiara Baldassari, Flow Boiling of Refrigerants Inside a Glass Minichannel, 08.05.2013, University of Bergamo, Italy, 1st supervisor
 13. Mauro Mameli, Pulsating Heat Pipes: Numerical Modeling and Experimental Assessment, 11.04.2012, University of Bergamo, Italy, 1st supervisor
 14. Carlo Antonini, Superhydrophobicity as a Strategy Against Icing. Analysis of the water/surface dynamic interaction for icing mitigation, 21.04.2011, University of Bergamo, Italy, 1st supervisor
 15. Lucia Cattani, L'edificio energeticamente sostenibile: verifiche energetiche, strategie per la raccolta dati e tecniche d'intervento per edifici esistenti, 16.04.2009, University of Bergamo, Italy, 1st supervisor
 16. Stefano Dall'Olio, Boiling of R134a Inside a Glass Minichannel. A New Approach of Flow Pattern Characterization Based on Flow Visualization, 16.04.2009, University of Bergamo, Italy, 1st supervisor
 17. Stefano Zinna, Numerical Analysis of a Loop Heat Pipe for the Thermal Control of a Cryo-Cooler on the International Space Station, 22.5.2007, University of Bergamo, Italy, 1st supervisor
 18. Maurizio Santini, Effect of surface properties on secondary atomization by impact of drops over heated surfaces, 16.3.2005, University of Parma, Italy, 2nd supervisor
 19. Romain Rioboo, Impact de gouttes sur surfaces solides et sèches, 27.02.2001, Université Pierre et Marie Curie - Université Paris 6, 3rd supervisor

(v) Related administration

Since 2004 I dedicated myself to building a research group at international level, even with the scarce financial support I could receive in Italy. I managed a growing group of postgraduate students and young research fellows (up to 26 people in 2013), helping them to develop proposals, entering into contracts with companies for consultancies, mentoring them for the writing of reports and papers. I managed all the work around several grants, from the design of the idea to the submission of the bid, and finally to the delivery of the results.

I carried out the complete path of research & innovation, from the concept to the managing of resources and personnel, until the final scientific deliverables for:

Topic 1: Liquid Interfaces/Drop impact onto solid surfaces and liquid films

Topic 2: Two-Phase Systems/Flow and Pool Boiling

Topic 3: Thermal Control for Space Applications/Heat Pipes/Pulsating Heat Pipes

Topic 4: DNS Simulations of Phase-Change Phenomena

From 2019 I am also working on a new Topic, Mesoscale Simulations of Nucleation phenomena.

I have also mentored many junior colleagues, amongst others I may cite Dr. Romain Rioboo, now Chief Scientist in a Belgium company working for space applications, Prof. Maurizio Santini, now Associate Professor at the University of Bergamo, Italy, Dr. Stefano Zinna, now Technical Specialist at Mecal in The Netherlands, Dr. Carlo Antonini, now Associate Professor at the University Bicocca, Milan, Italy.

I managed UNIHEAT srl, my first spin-off company, for 5 years, supervising personnel, chasing banks and funding institutions, establishing contacts with new customers, drafting contracts and various legal documents, finding a new location for the company, preparing budget cases for venture capitals, and so on. It was a rather complex and all-embracing managerial activity.

I did various presentation in secondary Schools, i.e. for students from 14 to 18 years old, among which a last one was in Darfo Boario Terme, Italy, on 23.12.2016 about Science in Space, in front of almost 100 Italian students, selected for the national program of the International Mathematical Olympiad.

I gave a speech on Space Experiments to the Lewes U3A in February 2021.

I organised more than 70 seminars in Bergamo and Brighton, including the Distinguished Lecture Series as Chair of the LHPS College Professoriate Group in Brighton.

I established new contacts with funding bodies, such as the Italian Space Agency, CARIPO Trust in Italy, UK Space Agency in UK.

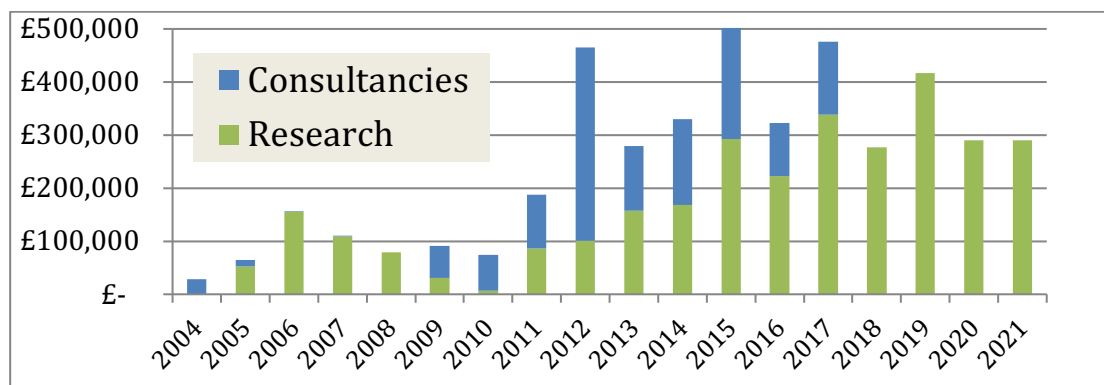
(vi) Any research and enterprise responsibilities which are not typical of your academic pathway

N.A.

(vii) Research and Enterprise Income

Before 2004 I don't have research projects formally under my name as investigator and/or co-investigator, since all the proposals I submitted were signed with the name of the full professor leading the research group. Therefore, officially I have research projects as PI or Co-I since 2004. In total, from 2004 to 2013, I submitted 42 proposals at national and international level with a success rate of 50%. From 2014 to **2021** I submitted other 40 proposals with a success rate of **58%** including the internal bids of the University of Brighton. The total sum of the research income linked to research projects is equal to £3,757,000.

On the enterprise side, from 2004 I carried out 54 industrial consultancies, for a total amount of 1,375,955. In the figure below, the statistics of my R&E Income in terms of **yearly budget** (actualised considering a yearly average GBP exchange rate of 1.2€/£).



(viii) Enterprise / Innovation Grants

24.04.2019 – present Founder and Board Member of the start-up company **FREDS4BUILDING**, Brighton, UK – Dormant company

Main activities of FREDS4BUILDING company

- Early-stage simulation of energy loads in buildings
- Consulting for energy estimation and energy assessment in new and refurbished buildings

Average Turnover 2020: 0k€/yr.

01.02.2010 – 12.07.2012 Founder and Board member of the start-up company **ICENOVA srl**, Bergamo Board of Trade incubator, Brembate di Sopra, Italy.

ICENOVA srl was a start-up company working in the field of energy.

Main activities of ICENOVA srl company

- Energy audits of industrial plants
- Design of waste heat recovery systems
- Design of heat exchangers
- Financial evaluation of energy systems
- Consulting for energy contracts

Average Turnover 2010-2012: 96k€/yr.

06.11.2007 – 31.12.2011 Founder and President of the university spin-off **UNIHEAT srl**, Bagnatica, Italy.

UNIHEAT srl was a university spin-off company working in the field of thermal management, Engineering consultant company in thermal and energy sector. Main activities of UNIHEAT srl company:

- Mold cooling for plastics injection and die casting
- LED thermal control
- Design of heat exchangers
- Design of a polymeric flexible systems for heat dissipation
- Thermal analysis of kitchen ovens and induction plates
- Thermal control of a PV cell for solar concentration

Main customers: B.M. Plastic, Intel, Whirlpool, Candy, ABB, Cree Led, Artemide, Halfen-Dea, CBF Engineering, Fondermat, Warrant Group

Average Turnover 2007-2011: 181k€/yr

(viii) Innovation Grants

My experience is that the most important, breakthrough and far-reaching impact cases are coming from the interaction between academia and industrial world. Looking at my whole career, I carried out **six main innovation projects** partially supported by public bodies.

1. **2019** Buildings are responsible for consumption of a huge amount of energy due to their long lifetimes and continuous operation. Efficient engineering and architectural design is critical, especially at the early stages, as poor decisions made early are difficult or even impossible to correct, resulting in inefficiencies and problems during the operational phase. Existing energy simulation tools fail to meet the needs of architects and building designers at the early stages of design due to the excessive complexity of the tools and required technical knowledge. FREDs is a Software Platform which provides a fast and simple way to perform building energy simulations and assist with the selection of appropriate building components and systems during early design stages. FREDs offers a complete and accurate evaluation of the energy and comfort performance of a built environment (even in the design phase) considering the climate, the use, the geometry and the materials of the building. The proposed simulation tool will be based on a simplified building description model previously developed by Dr. Marco Picco, under supervision of Dr. Marco Marengo, during his PhD studies (2012-2014). Objective of the academic study was to develop a simple but accurate model to enable complex dynamic energy simulation of buildings by only requiring a limited number of inputs easily available during design or feasibility analysis. FREDs uses the open-source code EnergyPlus™ issued by the US Department of Energy (DoE) and uses the developed protocol and algorithms to quickly deliver complex building performance analyses. FREDs won two internal bids of the University of Brighton, and it has been transferred to the NewCo FREDs4BUILDING, funded in April 2019. The site is fully operative from 31.10.2019: <https://www.freds4buildings.com>
2. **2016** Tatamotors UK TMETC proposed to my research team an INNOVATE UK proposal titled LOOP Heat Pump Circuit (LOOPER). The project assessed the feasibility of integrating a Loop Heat Pipe into a heat pump for a battery electric vehicle (BEV) and determined the potential reductions in energy used to provide cabin heating and cooling. The feasibility study was conducted using an advanced Co-Simulation technique using Computer Aided Engineering software and applying 1D system and 3D CFD vehicle level simulation techniques. The novel 1D model was designed and built by us in Brighton. The project benefited from TMETC's expert knowledge on BEV product development, cabin comfort know-how, vehicle level aerodynamics and system level CAE. Our contribution was essential to deliver novel software to simulate the Loop Heat Pipes for BEVs. This work has further established our recognition in the field of thermal management in the automotive sector, and it is directly linked to the submission of a EU project "Individual Fellowship" THERMBAT by a Research Fellow, Dr. Mangini. A journal publication accepted in 2019 (Bernagozzi, M., Charmer, S., Georgoulas, A., Malavasi, I., Miche', N., Marengo, M., *Lumped parameter network simulation of a Loop Heat Pipe for energy management systems in full electric vehicles*, Applied Thermal Engineering, 141, pp. 617-629, doi: 10.1016/j.applthermaleng.2018.06.013, 2018).
3. **2013** I received a research contract for 75k€ by TENARIS DALMINE SPA, a leading supplier of tubes and related services for the world's energy industry and certain other industrial applications with a global revenue of more than 4.3B\$, in order to understand the possibility of using hydrophobic and super-hydrophobic surfaces to decrease the pressure drops with two- and three-phase flows. The two-year project led to the recognition of very high potentials in terms of energy saving and less material corrosion, even if at the moment the coating durability is not yet suitable for the oil applications. Moreover, two Journal papers have been published using the data obtained through this consultancy (I. Bernagozzi, C. Antonini, F. Villa, M. Marengo, *Fabricating superhydrophobic aluminum: an optimized one-step wet synthesis using fluoroalkyl silane*, Colloids and Surfaces A: Physicochemical And Engineering Aspects, 2013, doi: 10.1016/j.colsurfa.2013.05.042; I. Malavasi, I. Bernagozzi, C. Antonini, M. Marengo, *Assessing Durability of Superhydrophobic Surfaces*, Surface Innovations 3 (1), 49-60, 2015, doi: 10.1680/si.14.00001) with more than 50 citations in two years.
4. **2009** UNIHEAT s.r.l. received a contract by INTEL, an American multinational corporation and technology company and the world's second largest and second highest valued semiconductor chip makers, to develop a polymeric pulsating heat pipe for smartphones. The contract started because Dr. Rajiv Mongia, Director at INTEL, noticed my previous invention (see Patent N. 4 in the list below). We worked for one year to deliver a design of the system, which brought to a second patent on 12 Nov 2009 (<http://www.google.com/patents/US20110067843>). The project is still in my mind as proven by the recent (even if unsuccessful) submission to EPSRC of the project "Flexible Heat Pipe

Technology for Distributed Cooling/Heating and Energy Harvesting” with the University of Liverpool. This concept was the first of its kind in the scientific literature and only in 2017 Samsung was able to develop a working prototype in Korea, confirming the feasibility and excellence of this idea.

5. **2009** UNIHEAT s.r.l. received a public grant of 620k€ from the Italian Ministry of Industry for a three-year project with WHIRLPOOL (Bando Industria 2015, Project N. EE_00076) about “Development of integrated systems for innovative domestic appliances with reduce energy consumption”. WHIRPOOL is the world's largest home appliance maker (revenue 21B\$). The premature closure of the company in 2011 caused the end of the project, but we have found interesting, novel solutions for the waste heat recovery in the kitchen, which have been later on used in the market with the trademark “Greenkitchen” (<http://mea.whirlpool.com/discover-whirlpool/sustainability/green-kitchen>). Due to confidentiality reasons, no open publication was produced. WHIRPOOL recognised this work asking me to participate to their “inventor sessions” after the end of the project.
6. **2007** I was able to raise the interest of Aermacchi S.p.A. (now incorporated in LEONARDO S.p.A, one of the largest European company in in aerospace, defence and security with a revenue of 12B\$) in using superhydrophobic coatings for icing mitigation on the plane wings. This was the beginning of a long-term collaboration, terminated only in 2013, with the project “Accordo Quadro” financed by the Lombardy Region. Overall the collaboration with Aermacchi brought more than 300k€ to the University of Bergamo, with 3 post-docs working on this project and two international collaborations (University of Alberta, Edmonton, and McGill University, Montreal, Canada) and a national collaboration with Polytechnic of Milan. The study discovered the chance to reduce up to 80% of the energy consumption used by the heating system for de-icing, opening an original route for a new ice-mitigation technique. Different journal and conference papers have originated from this project, but it is worth mentioning the paper “Understanding the effect of superhydrophobic coatings on energy reduction in anti-icing systems” by C. Antonini, M. Innocenti, T. Horn, M. Marengo, A. Amirfazli, Cold Regions Science and Technology 67(1), 58-67, which was the most cited paper of this Journal for many years. At the moment, it has already received more than 200 citations (Google Scholar).

(ix) Commercial activity

Since 2014 I carried out **12 commercial activities** (i.e. commercial contract with companies, which are not implemented through a public supporting scheme) for more than **£200k**:

1. CLEANERGY AB (Swedish company) for £ 25,515 in order to develop a cooling system of a Hybrid Solar Stirling Co-generator system using Sodium Thermosyphons, 2014-2015
2. GB Electronics Ltd (UK company) for £ 21,900 in order to develop a thermode for a measurement system for diabetic patients, 2014
3. ENVIROPOWER Ltd (UK company) for £ 5,000 in order to develop a model to estimate the impact of cooling systems of power plants on ponds and small lakes, 2014
4. ITERCHIMICA srl (Italian company) for € 35,000 in order to elaborate anti-icing strategies for asphalts, 2014-2015
5. CLAYPAKY srl (Italian company) for € 11,500 in order to design a natural convection cooling system for a theatre light, 2014
6. LUMINA srl (Italian company) for € 30,000 in order to design a special thermosyphon for LED lighting, 2015
7. CSA Boxdoccia (Italian company) for € 9,000 in order to check the feasibility of a air-curtain for a shower box, 2015
8. DH SOLAR Ltd (UK company) for £ 10,000 in order to optimize and validate an innovative thermal solar system prototype, 2015
9. GREENDAY GENERATION Ltd (UK company) for £ 13,000 in order to optimize financial return of photovoltaic solar fields, 2015
10. PEACE MARSH RENEWABLES Ltd – Coolnomix (UK company) for £ 3,334 in order to validate energy savings on a room cooling control device, 2015
11. ST JAMES' LAUNDRY Ltd (UK company) for £ 9,000 in order to understand the feasibility of a heat recovery system for their laundry tumble dryers, 2015
12. AQUACOMMAND Ltd (UK company) for £ 45,586 for testing, design and prototyping of innovative water meter and energy harvesting unit, 2017

From 2002 to 2014 I have carried out 42 industrial consultancies on topics such as:

- a. Optimization of a continuous ink-jet printing system
- b. Development of a code for the thermo-hydraulics design of a beer spilling system
- c. Thermal simulation of the Loop Heat Pipes for the AMS-02 experiment on the ISS

- d. Design of an anti-icing system for airplane nacelles
- e. Industrial thermal control in a thermoplastic process
- f. Electronic cooling
- g. Design of special thermo-hydraulics components

Main customers:

BMPlastic, Candy, ABB, Artemide, Halfen-Dea, CBF Engineering, Fondermat, Warrant Group, DH-Hiross, VinService, Bremed, IMS-Deltamatic, Carlo Gavazzi Space, BOSCH

(x) Patents

1. European Patent: Metodo e Apparato per lo Stampaggio a Caldo di Prodotti in Materiale Termoplastico, Applicant: B.M. Mobili in Plastica S.p.A., inventors: M. Marengo, A. Barcella, Filing: EP 06425432.9, Date: 17.07.2006
2. European Patent: Valve Mechanism for a thermo-hydraulic system, particularly for high pressure, Applicant: Records S.p.A., inventors: M. Marengo, G.E. Cossali, E. Gotti, Filing: EP 07112325.1-1252, Date: 12.07.2007
3. European Patent: Devices and method for enhanced heat transfer, Applicant: Université de Mons-Hainaut, inventors: R. Rioboo, M. Marengo, S. Dall'olio, M. Voué, J. De Coninck, Filing: EP 07113887.9-1266, Date: 06.08.2007
4. European Patent: Microdissipatore polimerico, in particolare per il condizionamento termico di dispositivi meccanici ed elettronici, Applicant: NANTO s.r.l., inventor: M. Marengo, Filing: RM2007A000593, Date: 15.11.2007
5. Italian Patent: Device and methods for drop generation, Applicant: Università di Bergamo, inventors: M. Santini, M. Marengo, G.E. Cossali, Filing: PCT IT2008/000554, Date: 22.08.2008
6. Italian Patent: Micro-cogenerator supplied by wood biomass, Applicant: ICENOVA s.r.l., inventors: M. Marengo, G. Suardi, D. Rossetti, Filing: GE2011U000029, Date: 15.11.2011
7. European Patent: Wick Structure for Two-phase Heat Transfer Apparatus, Applicant: Université Libre de Brussel, University of Bergamo, inventors: C. Buffone, M. Marengo, Filing: EP14157863.3, Date: 05.03.2014

3. ACADEMIC LEADERSHIP AND CITIZEN

(i) Academic leadership in the discipline

1. I am a visionary: my field is mechanical engineering, but **being a physicist** helped me to contaminate the usual topics of thermofluids in engineering with the **multi-disciplinarity** I have acquired during my University studies. In 1996 I studied the drop impact onto surfaces for understanding the secondary atomization of fuels in internal combustion engines, but afterwards in 2006 I moved in the direction of the influence of surface wettability, which is more a subject of chemistry, proposing with Prof. Alidad Amirfazli (now at York University) a **new technique for ice shedding**, and even **defining recipes for producing superhydrophobic aluminium surfaces**. I studied flow boiling from 2005 to 2018, and in 2006 I considered with Prof. Joel De Coninck to **introduce wettability patterns to enhance the boiling onset**, decreasing the boiling activation temperature, and a recent paper in Nature Scientific Report⁵ is another important output of this “vision” 12 years ago. In 2007 I started to work also in the field of **heat pipes**, and I envisioned the chance to use a particular, even forgotten kind of heat pipes, for space applications, until the point where my initial idea became feasible, I am leading a project with 20 partners for the European Space Agency, and I am only waiting for my experiment reaching the ISS in 2021. Finally, I am proud to have imagined already in 2007 the use of **OPENFOAM**, an open source code for CFD simulations, in a time when commercial codes, like FLUENT, were still dominating the market. My capacity to envision new, original, **breakthrough directions of research** led me to achieve **strong impact cases** in terms of applications and patents.

2. I am painting futures: I am always trying to persuade and convince without creating disillusion. The basic idea is to paint futures in research which are ambitious, but still realistic, where the application is very clear. The students, the colleagues from my University and other Universities worldwide, help me to converge and reach the task I have designed. I am able to attract the interest of very high level colleagues around the world and I published with more than 200 co-authors from more than 20 different countries. I have re-introduced in the scientific community of passive two-phase systems solutions for space applications, an almost abandoned idea (Pulsating Heat Pipe), until the

⁵ Villa, F., Marengo, M., De Coninck, J., A new model to predict the influence of surface temperature on contact angle, NATURE SCIENTIFIC REPORTS, 8 (1), 2018

point when **my experiment was selected for ISS with other two others among 12 competitors in Europe.**

3. I am always part of the team: passion, dedication and commitment are key values for academic leadership. Recently, I have proposed and organised with other 4 colleagues the 1st International Symposium on Pulsating/Oscillating Heat Pipes in Dajeong, Korea. **Chairing a conference such as the International Heat Pipe Conference and International Heat Pipe Symposium in 2018** is the outcome to engage actively in a scientific community and to have demonstrated scientific excellence. **I organised 3 times the conferences for the Institute of Liquid Atomization and Spray Systems** (in Sorrento in 2003, in Como in 2008 and finally in Brighton in 2016) because I recognised that community as a reference for me. In 2021 I have been the Chairman of the Scientific Committee of the International Institute of Liquid Atomization and Spray Systems (ICLASS) Conference in Edinburgh, UK. For the same scientific association, **I acted as European Newsletter Editor for ILASS Europe** from 2002 to 2009, when I was selected as **Editor of the International Journal Atomization & Sprays** linked to the association until 2018 when I stepped down to become Associate Editor of the International Journal of Multiphase Flows, Elsevier, the most recognised peer-reviewed journal in the field of multiphase flows. **I am part of the Scientific Committees of the ILASS and ICLASS conferences** since 2003.

4. I create my teams and support the teams I join: Since 2007 I have tried to build up a research group at international level. **My research group in Italy before I left was counting on 23 collaborators** (PhD and MSc students included). Also for many projects, I am always building up a team, as for the International Project on Pulsating Heat Pipes. I am very mindful of the behaviours and the interaction among the team members. My managing style can be depicted as democratic, and I like to see that my team members are growing as individuals and scientists. Also for the dissemination of my papers, I am always trying to include all the colleagues who gave a contribution and I am keen on supporting colleagues around the world to publish with me. The team is also built around a continuous mentoring of my collaborators, inspiring them towards new research topics and international collaborations.

5. I hope to be an example: The preparation of proposals, the attendance at Committees and Staff meetings, the tutoring of students, the constant organisation of regular meeting, **being a reviewer for more than 20 International Research peer-reviewed Journals⁶**, the presence in the lab and the availability for skype call when I am out of office, are a kind of trademark of my research and managing style. I am **actively supporting team members to re-enter in research**. Another important point is to teach my team how to understand the academic environment looking at the big picture, and not falling in despondency for the flaws of every work environment. Since 2015 I am founder and co-director of the **Advanced Course in Liquid Interfaces, Drops and Sprays**, which is now running its 7th edition. Together with my colleagues and co-directors, Prof. Alidad Amirfazli and Prof. Volfango Bertola, we have taught the disciplines at the highest scientific levels to more than 300 PhD students and researchers in 7 different countries (<http://pcwww.liv.ac.uk/~vbertola/Lidesp/Home.html>).

(ii) Academic leadership in the University

• Contributions to School/University committees and working groups

I was Member of the LHPS College Leadership Group (Jan 2016 – June 2016), and presently, I am **member of the CEM School's Research and Enterprise Committee**.

I have contributed to the constitution of the new CORE, Advanced Engineering Centre, and I take part in the AEC Strategy Board and the AEC Operation Board. I am also member of the Centre for Regenerative Medicine and Devices (CRMD) and I was invited to join the CoRE management team, as Lead of the research line "Advanced devices and smart systems".

In the past, I was member of the panel for the Curriculum Development for the Engineering Faculty of Bergamo from 1999 to 2004, member of the Business Engineering School panel for the Curriculum Development from 2004 to 2006 and member of the Building Engineering School panel for the Curriculum Development from 2007 to 2016. Furthermore, I was the dean delegate for the admission

⁶ Applied Energy, Applied Surface Science, Applied Thermal Engineering, Chemical Engineering Science, Advances in Colloid and Interface Science, Current Opinion in Colloid and Interface Science, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Cold Regions Science and Technology, Energy and Buildings, Experimental Thermal and Fluid Science, International Journal of Heat and Fluid Flow, International Journal of Heat and Mass Transfer, International Journal of Multiphase Flow, International Journal of Heat Pipe Science and Technology, Materials and Design, Journal of Non-Newtonian Fluid Mechanics, Mathematics and Computers in Simulation, Progress in Energy and Combustion Science, Solar Energy, Surface and Coatings Technology, International Journal of Thermal Sciences

of foreign students to the Engineering Courses at the University of Bergamo, from 2003 to 2009.

• **Taking positions of responsibility within the School/University**

Since Sept 2019, I am the new **Director of the Advanced Engineering Centre** of the University of Brighton. At the moment I am working on the re-organisation of the management and the new ToR of the Centre.

Since Jan 2019 I am the **Chair of the Engineering Division Industrial Advisory Board**. I have re-activated the Board with a new ToR document and the organisation of a pilot meeting event with companies and students.

I was **Chair of the Professoriate Advisory Group of the University of Brighton** (Jun 2017 – Dec 2019). I was **Chair of the College Professoriate Group of the College of Life, Health and Physical Sciences** (Nov 2015 – Jun 2017). Noteworthy, as Chair of the College Professoriate, I promoted the Distinguished Lecture Series, in order to widen the participation activities of the staff and the students to very high quality events. Inside this event, I was active in having an ATHENA SWAN lecture to highlight the attention of the Professoriate to gender equality.

At the University of Bergamo, I was **Assistant Pro-Vice Chancellor of the University of Bergamo for European Affairs and Projects**, Bruxelles, Belgium, 01.09.2003 – 30.06.2006, Co-director of the Experimental Laboratory of Microsystems and Robotics (LSRM) at the Research Centre for Innovation and Technology, Dalmine, Italy, 01.10.2002 – 30.06.2005.

(iii) Professional activities outside the University

• **Editorships, or memberships of editorial boards, of learned journals**

21.10.2021 – present Associate Editor for ASME's new open access journal, the *ASME Open Journal of Engineering* (AOJE)

29.07.2021 – present Editorial Board Member of NATURE Scientific Report (IF = 5.133)

01.01.2021 – present Associate Editor of MDPI Journal Energies (IF = 3.044)

01.01.2020 – present Review Editor on the Editorial Board of Microgravity - Frontiers

01.01.2019 – present Associate Editor of International Journal of Multiphase Flows, Elsevier (IF = 3.083)⁷

<https://www.journals.elsevier.com/international-journal-of-multiphase-flow/editorial-board>

2019 – present Editorial Board Member for the book series in Physical Sciences and Engineering, ISCI Publishing

<https://www.iscipublishing.org/editorial-board/>

19.10.2018 – present Advisory Board Member of MDPI Sci

01.01.2018 - present Editor-in-Chief of the Section "Thermal Management" of the MDPI Journal Energies, IF = 2.702

https://www.mdpi.com/journal/energies/sectioneditors/thermal_management

2011 - present Editorial Board Member of "International Review of Chemical Engineering", Praise Worthy Prize

<https://www.praiseworthyprize.org/jsm/index.php?journal=ireche&page=about&op=editorialTeam>

2019 - present Editorial Board Member of Atomization and Sprays Int. Journal -

<http://www.begellhouse.com/journals/atomization-and-sprays.html>

2010 - 2018 Editorial Board Member of "Int. Journal of Heat Pipes Science and Technology", Begell House

2009 - 2018 Editor-in-chief of Atomization and Sprays Int. Journal -

<http://www.begellhouse.com/journals/atomization-and-sprays.html>

• **Appointment to national or international bodies**

Among the others, it is worth to cite the following appointments:

Jun 2018-Sept 2019 **Member of the Space Environment Advisory Committee - UK Space Agency**. *This body provides advice on the overall UK strategy and priorities for involvement in Aurora, planetary exploration and the microgravity ELIPS programme. Recent examples of SEAC input include the reviews of the Robotic Exploration Strategy, Aurora Science Knowledge Transfer AO and approval of*

⁷ <https://www.journals.elsevier.com/international-journal-of-multiphase-flow/editorial-board>

lines for PB-HME. It is one of the ten Advisory Committees of the UKSA.

- Oct 2016-present** **UK scientific representative in the International Heat Pipe Conference Committee.** *This unique, international group is the exclusive committee of 19 highly distinguished scientists in the field of Heat Pipes. The membership is given by merit and looking at the international stand and it is only by invitation. There is one member for each country which has given a substantial contribution in the field. The membership is permanent. Since 1973 the IHPCC members met once per year to analyse the research outlook and to organise the International Heat Pipe Conference and Heat Pipe Symposium (to be held every two or three years). The IHPC&HPS is the most important venue in the field of passive two-phase systems in the world.*
- Dec 2015- May 2018** **Member of the Space Environment Working Group - UK Space Agency.** *This membership is important, since the 9 members of SEWG are advising the UK Space Agency Director about the National Strategies of the Physical and Life Sciences experiments in Space and Human Exploration. The members are coming from important UK Universities (UCL, Cranfield), Laboratories such as NPL, and primary UK space companies.*
- July 2014-present** **Member of the ELIPS-4 project SELENE** (SELf-rewetting fluids for thermal ENERgy management in space)
- Oct 2013-present** **Scientific Coordinator of the International Pulsating Heat Pipe Scientific Team** for the Thermal Platform on the International Space Station, European Space Agency, The Netherlands. *This is an important appointment, since this kind of opportunities are happening once in the whole academic life, due to the very long journey of building up the team, obtaining good results and being finally selected for the ISS. From the first idea (2007) to the actual experiment on the ISS, I and my team will spend 14 years in the preparation, the experimental design, the final delivery from the scientific team to the ESA Engineering Team and the rocket launch to the ISS. The Scientific Team is made up of 11 partners around the world.*
- 2009 - present** Scientific Committee member of European Microfluidics Conference
- 2009- present** Scientific Committee member of WSEAS int. Conf. On Heat Transfer, Thermal Engineering and Environment
- 2008 – 2013** Member of European Low Gravity Research Association
- 2006 - present** Scientific Committee member of ICLASS International Conferences
- 2005 - present** Member of the Board of the European Institute of Liquid Atomization and Spray Systems
- 2005- present** Scientific Committee member of ICLASS Europe Conference

In the professional environment, among other commitments, I was the Scientific manager of the Sustainability and Energy action plan, City Council of Bergamo, Bergamo, Italy, 01.04.2010 – 31.10.2011, and the Commissioner of the assignation board of the international Tender for the Construction of Broadening of Orio al Serio Airport, Bergamo.