Curriculum Vitae of Daniele Marchisio

Work address	Dipartimento di Scienza Applicata e Tecnologia, Istituto di Ingegneria Chimica, Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino (TO) Italy		
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ORCID	https://orcid.org/0000-0002-9104-0571		
Current position	*Full Professor of Chemical Engineering*		
Personal information	Born in Savona (SV) on 21/12/1973	Male	Married with no children

1. Education

BS & MS (*cum laude*) in Chemical Engineering	1992 - 1997	**Politecnico di Torino** (Italy)
PhD in Chemical Engineering	1998 – 2001	**Politecnico di Torino** (Italy)
	1999 - 2000	Visiting Scholar at **Iowa State University** (USA)
Post-doc in Chemical Engineering	2001 – 2003	**Iowa State University** (USA)
Post-doc / academic guest in Chemical Engineering	2004	**Eidgenössische Technische Hochschule** (ETH) of Zurich (Switzerland)

2. Work & research experience

1998	*Engineer Intern* at the Rome Technical Center of **Procter & Gamble** (Italy)
2004 – 2010	*Assistant Professor* at the Department of Material Science and Chemical Engineering of **Politecnico di Torino** (Italy)
Summers of 2007 & 2008	*Visiting Professor* at the Department of Chemical Engineering of **University College London** (UK)
2010 – 2016	*Associate Professor* at the Department of Material Science and

	Chemical Engineering (now Applied Science and Technology) of **Politecnico di Torino** (Italy)
2012 (Dec.) – 2013 (Feb.)	*Visiting Scientist* at **CSIRO** (CMIS – Clayton, Melbourne, VIC, Australia)
2016 – 2019	*Adjunct Visiting Professor* at the **Beijing University of Chemical Technology** (China)
2016 – present	*Full Professor* at the Department of Applied Science and Technology of the **Politecnico di Torino** (Italy)

3. International Awards & Recognition

1997	Laurea Prize "Vittorio de Bernochi" from the Association of Architects and Engineers of the Politecnico di Torino as the best graduate in Chemical Engineering in the year 1997
1998	Prize "Optime" from the Industrial Union of Turin as one of the best 100 students of the year
2001	United Engineering Foundation Conference Fellowship, for attending the Chemical Reaction Engineering Conference (24-29 June 2001, Barga, Italy)
2007	Most cited paper for Chemical Engineering Science: D.L. Marchisio, R.D. Vigil, R.O. Fox (2003) Implementation of the Quadrature Method of Moments in CFD codes for aggregation-breakage problems, Chemical Engineering Science, 58, 3337-3351
2007	Recipient of the International Incoming Short Visits fellowship funded by the Royal Society of the United Kingdom
2010	Sciencedirect top 25 most downloaded article for: M. Hussain, R. Ceccarelli, D.L. Marchisio, D. Fino, N. Russo, F. Geobaldo (2010) Synthesis, characterization and photocatalytic application of novel TiO2 nanoparticles, Chemical Engineering Journal. 157, 45-51
2016	Highly cited paper for the International Journal of Multiphase Flow for the work "Multivariate Quadrature-Based Moments Methods for turbulent polydisperse gas-liquid systems"

4. Membership in Professional Organizations and Scientific Committees

- *Member* of the American Institute of Chemical Engineering (AIChE) https://www.aiche.org/
- *Member* of the Italian Association of Chemical Engineering (AIDIC) https://www.aidic.it/
- *Member* of the European Federation of Chemical Engineering (EFCE) https://efce.info/
- *Member* of the Working Parties on Multiphase Flows (delegate) and Mixing (guest) of the EFCE
- *Chairman* (from 2021) of the Working Party on Crystallization of the EFCE https://efce.info/WPC.html
- *Consigliere/Vice-president* (from 2017 to 2019) of the GRICU (Gruppo Ricercatori Ingegneria Chimica dell'Università – University Researchers in Chemical Engineering) https://www.gricu.it/en/home_en/

5. Institutional roles

- Coordinator of the Doctoral Program in Chemical Engineering at Politecnico di Torino (2017 – 2019)
- Member of the Academic Senate of Politecnico di Torino (2019 - 2023)
  Daniele Marchisio represents in the Academic Senate the full professors of the university and as a member of the Senate represents in turn the Senate in a number of additional mixed committees (including also members of the Board of Directors) on for example Strategic Planning for Research and for Doctorate Studies - https://www.polito.it/ateneo/organizzazione/organi/senato.php?lang=en
- Member of the Gender Equality Observatory of Politecnico di Torino (2020 – 2023)
  Daniele Marchisio contributed to the preparation of the Gender Equality Action Plan (GEAP) which is, starting from 2022, an eligibility criterion for institutions wishing to participate in Horizon Europe

https://www.life.polito.it/en/content/download/341/2054/file/GEP%20GEAP%20PoliTo%20dic21_sito_web_def.pdf

- Representative of Politecnico di Torino in the Italian node IT-SIMUL of CECAM (2017-2020)
  Daniele Marchisio represented Politecnico di Torino in the Italian node of this important institution and was responsible for the organization of dissemination and education events in the field of atomistic and molecular modelling for multiphase and interfacial systems
  https://www.cecam.org/

6. Membership in editorial boards of international journals, scientific committees of international conferences and reviewing activity

- Associate Editor for the Canadian Journal of Chemical Engineering
  https://onlinelibrary.wiley.com/page/journal/1939019x/homepage/editorialboard.html
- Member of the Editorial Board of the journal Energy and AI
  https://www.journals.elsevier.com/energy-and-ai/editorial-board
- Member of the Advisory Board of Chemical Engineering & Technology
  https://onlinelibrary.wiley.com/page/journal/15214125/homepage/2044_edbd.html
- Co-chair of the int. conference Parallel CFD (parCFD) to be held in Alba (Italy) on May 25-27, 2022
  https://parcfd2022.org/about/committees/
- Topic Chair (T5 Particle formation and design) of the World Congress on Particle Technology to be held in Madrid (Spain) on Sept. 18-22, 2022
  https://wcpt9.org/scientific-committee/
- Member of scientific/organizing committees of the Population Balance Modelling Conference (http://pbm2022.univ-lyon1.fr/en/pages/pbm-2022-committees), International Symposium on Industrial Crystallization (https://dechema.de/en/ISIC_2021.html), International Conference on Numerical Methods in Multiphase Flows (https://sites.psu.edu/icnmmf4/osc/), International Conference on Multiphase flows, European Conference on Mixing, just to cite the most recent
- Reviewer for the most important journals in his field (*Journal of Computational Physics, International Journal of Multiphase Flows, A.I.Ch.E. Journal, Chemical Engineering Science, Journal of Colloid and Interface Science, Chemical Engineering Journal, Industrial and Engineering Chemistry Research, Chemical Engineering Research and Design, Computers & Chemical Engineering, Physical Review E, Journal of Pharmaceutical Sciences, etc.*) as well as for the Cambridge University Press for book proposal reviewing
- Reviewer for grant proposals for the Swiss National Science Foundation, German Science Foundation (DFG), Austrian Science Foundation, Beijing University of Chemical Technology, Fundação para a Ciência e a Tecnologia of Portugal and Research Council of Norway

7. Invited/Keynote/Plenary Lectures, Invited Seminars and Organization of Summer Schools

Daniele Marchisio has delivered numerous **invited/keynote/plenary lectures at important international conferences,** among which the most recent are:

- Premiere webinar series on Application of AI to chemical engineering, on-line webinar hosted by Imperial College London, UK, 15 December 2021
  (https://twitter.com/PREMIERE_UKRI/status/1468910794599505920)
- On-line workshop on Continuous Particle Synthesis, hosted by FAU, Germany, 4-6 October 2021
  (https://www.crc1411.research.fau.eu/2021/10/08/international-online-workshop-on-continuous-particle-synthesis-and-product-design/)
- Opening lecture of the 4th Machine Learning and AI in Bio(Chemical) Engineering, on-line webinar, hosted by the University of Cambridge, UK, 6-7 July 2022 (https://www.mabc-cambridge.ai/)
- Recent advances in the simulation of bubbly flows with CFD, webinar organized and hosted by Fluid Mixing Processes – IChemE, UK, 27 March 2020

(https://www.icheme.org/membership/communities/special-interest-groups/fluid-mixing-processes/events/27-03-20-recent-advances-in-the-simulation-of-bubbly-flows-in-stirred-tanks-and-bubble-columns-with-cfd-and-pbm/)

- Recent Advances in Bubble Columns, SFGP/EFCE, Paris, France, 5 November 2019 (https://www.tec21.fr/app/download/9552068286/Recent%20advances%20in%20Bubble%20Columns.pdf?t=1621593522)
- BIRS-CMO Workshop: New Frontiers in Multiphase CFD for the 21st Century Energy Mix at Casa Matemática Oaxaca, Mexico, 19-24 August 2018 (https://www.birs.ca/events/2018/5-day-workshops/18w5139)
  The recording of the invited lecture is available at this link: https://www.birs.ca/events/2018/5-day-workshops/18w5139/videos/watch/201808221007-Marchisio.html
- 14th International Conference on Multiphase Flow, Desenzano, Italy, 13-17 September 2017 (https://prodottieditoriali.animp.it/prodotti_editoriali/materiali/convegni/pdf/convegno_MFIP_2017/MFIP_2017_PRG_def.pdf)
- 15th Multiphase Flow Conference and Short Course: Simulation, Experiment and Application, Dresden, Germany, 14-17 November 2017 (https://www.hzdr.de/db/Cms?pOid=54414)
- Dynamics of Evolving Fluid Interfaces – DEFI; Lyon, France, 12-13 October 2016 (https://www.youtube.com/watch?v=xGc2s8ePqwI)
- 19th International Symposium of Industrial Crystallization, Toulouse, France, 16-19 September 2014
- 5th International Conference on Population Balance Modelling, Bangalore, India, 11-13 September 2013 (https://chemeng.iisc.ac.in/pbm2013/pbm2013-programme.pdf)
- 9th European Congress of Chemical Engineering, The Hague, The Netherlands, 21-24 April 2013
- North American Mixing Forum – Mixing XXIII, Cancun, Mexico, 17-23 June 2013 (http://www.mixing.net/Conferences/mix23/ProgramNAMF_Final.pdf)
- 50th European Two-Phase Flows Group Meeting, 2012 - 2nd Joint ETPFG-EFCE Multi-Phase Meeting, Udine (Italy) 16-18 May 2012 (http://calliope.dem.uniud.it/ETPFGM-12/final-programme.pdf)

Daniele Marchisio has delivered numerous **invited seminars at public and private institutions** around the world (TU Darmstadt, TU Munich, University College London, Imperial College London, CSIRO Melbourne, MIT, University of Warwick, CEA Marcoule, Warsaw Technical University, Eindhoven Technical University and Multiscale Institute, Aalto University, University of Alberta, Beijing University of Chemical Technology, Iowa State University, Université Paris-Saclay, etc.)

Daniele Marchisio has **organized and lectured in more than 20 advanced doctorate summer schools** on several topics including: multiscale modelling, simulation of multiphase flows and population balance modelling (Particulate flows and separation technologies in industrial applications – online; Von Karman Institute, Belgium, 2021; 6th IMPRS Summer School: Particulate systems: From theory to applications; Magdeburg, Germany, 2019; Fluid dynamics effects on particle formation in crystallization processes, CISM, Italy, 2018; GRICU Summer School on Multiscale Modelling, Palermo, Italy, 2017; Multiscale modelling of flowing soft matter, CISM, Italy, 2016; Multiscale modelling and Multiphysics coupling in solid and fluids mechanics, TEC21, France, 2015; 3rd Summer School of the IMPRS Magdeburg, Germany, 2013; Computational Models for Polydisperse Particulate and Multiphase Systems, CSIRO – CMIS, Australia, 2013; Multiphase turbulent reacting flows, CISM, 2006; etc.)

8. Tutoring & Research Activity, Coordination of National and International Projects

Daniele Marchisio has acted as **supervisor for numerous batchelor and master** students on a regular basis.
Daniele Marchisio has acted as **supervisor or co-supervisor for the following PhD students** (26 in total):
Liliana Rivautella (2004-2006), Federica Omegna (2005-2007), Emmanuela Gavi (2006-2008) Valeria Rasetto (2006-2008), Federica Lince (2007-2009), Samir Bensaid (2007-2009), Danilo Carvajal (2008-2010), Ilaria Valente (2009-2011), Matteo Icardi (2009-2011), Antonio Buffo (2010-2012), Nicodemo Di Pasquale (2010-

2012), Mauricio Coletto (2011-2014), Gianluca Boccardo (2012-2014), Francesca Messina (2012-2014), Eleonora Crevacore (2014-2016), Luca Gemello (2015-2018), Alessio Lavino (2015-2018), Hermes Droghetti (2015-2018), Giovanni Tronci (2017-2020), Francesca Demichelis (2017-2020), Sabia Carmine (2018-2021), Enrico Agostini (2019-2022), Agnese Marcato (2019-2022), Antonello Raponi (2020-2023), Nunzia Lauriello (2021-2024), Sandro Malusà (2021-2024).
Daniele Marchisio he has acted as **supervisor for numerous post-doctoral students**, research assistants & visiting scholars:
Yann Sommer de Gelicour (2005), Jose Sierra-Pallares (2010), Mohsen Karimi (2014-2016), Jeremias de Bona (2014-2016), Francesco Ferrante (2015), Steffen Salenbauch (2015), Pavel Ferkl (2016), Dongyue Li (2015-2017), Luca Spigarelli (2017), Graziano Frungieri (2018-2022), Salvatore Falzone (2019), Mohsen Shiea (2019-2022), Andrea Querio (2020-2022), Maria Laura Para (2019-2021), Mojtaba Alidoost (2019-2020), Luca Banetta (2021-2023), Francesco Maniscalco (2019-2022), Marco Ferrari (2019-2022), Juliusz Kondracki (2020-2021), Yi Feng (2021-2022)

Daniele Marchisio's research activity focuses on the development, experimental validation and implementation of computational methods for multiscale modeling, with a particular focus on **turbulent multiphase** reacting **systems**. His early research interests focused on the treatment of very fast chemical reactions with **computational fluid dynamics** (CFD) through the Reynolds-Averaged Navier-Stokes equations (RANS) and the Large Eddy Simulation (LES) approach. Subsequently, he has been interested in the description of the evolution of multiphase systems through **population balance models** (PBM). He developed, investigated and validated an entire class of methods (**quadrature-based moments methods**, QBMM) that are now employed in commercial and open-source CFD codes. These methods have been also applied to the atomistic description of fluids, by solving the Boltzmann equation. In the last decade the problem of coupling, following the multiscale approach, different scales and models, namely fully atomistic and coarse-grained **molecular dynamics** (MD) simulations, mesoscale models, such as **dissipative particle dynamics** (DPD) and continuum models (CFD), has also been investigated. Daniele Marchisio has applied these computational models for the simulation of **multiphase/interfacial systems**, **crystallization and precipitation processes**, **particle formation** in flames, **particle filtration**, **particle dispersion** in polymers, **flow and transport in porous media**, **flowing colloids and soft systems**, reacting **polymer foams**, **non-Newtonian flows**, **bubble columns** and **gas-liquid stirred tanks**, **emulsions** and **liquid-liquid dispersions**. More recently Daniele Marchisio has explored the possibility of coupling physics-based models with data-driven models with a focus on **machine and deep learning algorithms** (such as neural networks). Recent applications involve the **production of battery materials**, **battery recycling**, **battery modelling**, **CO_2 capture** and **storage** and **food emulsions**.

These research activities are carried out in four physical laboratories, which Daniele Marchisio has contributed creating and running:

- Center for multiscale process simulation
  https://www.disat.polito.it/the_department/internal_structures/department_labs/laboratori_area_ingegneria_chimica/center_for_multiscale_process_simulation
- Nanoparticle synthesis and characterization laboratory
  https://www.disat.polito.it/the_department/internal_structures/department_labs/laboratori_area_ingegneria_chimica/nanoparticles_synthesis_and_characterization_laboratory
- Multiphase systems and reactor laboratory
  https://www.disat.polito.it/the_department/internal_structures/department_labs/laboratori_area_ingegneria_chimica/multiphase_systems_and_reactors_laboratory
- High Performance Computing center of Politecnico di Torino HPC@POLITO
  https://www.hpc.polito.it/

These research activities are carried out in the context different collaborative international projects involving many important public and private institutions such as MIT, University of Manchester, University of California San Diego, Beijing University of Chemical Technology, University of Texas Austin, University College London, TU/Eindhoven, TU/Darmstadt, Czech Academy of Sciences, University of Chemical

Technology Prague, ETH Zurich, Iowa State University, University of Barcellona, IFP Energie Nouvelles, Fraunhofer Institute, EDF, CMCL, BASF, Unilever, Continental, Umicore etc.

Daniele Marchisio coordinates and runs a large research group comprising a fluctuating number of PhD students and research assistants (between 10 and 20). He is responsible for funding acquisition, coordination of the research activity, tutoring of the students, definition of the dissemination and publication strategy of the group and definition of the future strategies of the group. The research group is supported by different financial initiatives in which Daniele Marchisio is acting or has acted as **Principal Investigator** (selection of most relevant projects in the last 10 years in the table below).

Years	Title	Funded by	Role	Amount
2021-2022	Almafluida: CFD simulation of industrial autoclaves for the production of polymer composites	Regione Toscana and Italmatic (Italy)	PI for POLITO	100 k€
2020-2022	BIG-MAP: Building a Low-Carbon, Climate Resilient Future: Next-Generation Batteries	European Commission (H2020)	PI for DISAT	201 k€
2020-2022	SEA Circular Processing of Seawater Brines from Saltworks for Recovery of Valuable Raw Materials	European Commission (H2020)	PI for POLITO	120 k€
2020-2022	Multiscale modelling of structured fluids	Rodhia/Solvay (France)	PI for POLITO	150 k€
2019-2022	SimDOME: Digital Ontology-based Modelling Environment for Simulation of materials	European Commission (H2020)	PI for POLITO	575 k€
2018-2022	VIMMP: Virtual Materials (Modelling) Marketplace	European Commission (H2020)	PI for POLITO	650 k€
2017-2019	CFD simulation of precipitation processes	BASF (Germany)	PI for POLITO	60 k€
2017-2020	CFD simulation of foam formation in carbonated beverages	Sidel/Tetrapack/Optimad	PI for POLITO	115 k€
2015-2018	Simulation of industrial bubble columns under heterogeneous regime with CFD and PBM	IFP Energie Nouvelles (France)	PI for POLITO	30 k€
2014-2016	MODENA: Modelling of morphology development of micro- and nano-structures	European Commission (FP7)	PI for POLITO	305 k€
2012-2014	CFD simulation of gas-liquid reactors with population balances	BASF (Germany)	PI for POLITO	120 k€

Daniele Marchisio has also been very active in the coordination and preparation of proposals for the Italian Ministry or Higher Education and Research (within the PRIN, https://prin.mur.gov.it/, and FISR, https://www.mur.gov.it/it/aree-tematiche/ricerca/iniziative-speciali-e-grandi-ricerche/fisr, schemes) and numerous calls of the European Commission (e.g. Marie Curie actions).

In the period from 2017 to 2019 Daniele Marchisio was identified by Politecnico di Torino one of the TOP50 fundraisers of the university (out of 1000 faculty members) and was granted a reduction of the number of frontal teaching hours per academic year to focus on research activities.

9. Publications & Citation Report

Daniele Marchisio has published more than 300 papers on international journals and on proceedings of international conferences. A complete list of his publications can be found at this link:
https://iris.polito.it/browse?type=author&authority=rp10066&sort_by=2&order=DESC

He has authored one book:

- Marchisio D.L., Fox R.O. (2013) Computational Models for Polydisperse Particulate and Multiphase Systems, Cambridge University Press: Cambridge; ISBN: 978-0-521-85848-9 https://doi.org/10.1017/CBO9781139016599

which according to google scholar has attracted 400+ citations. The citation numbers of Daniele Marchisio are summarized in the table below.

February 2022	Scopus	Web of Science	Google Scholar
Total number of documents	170	165	296
Total number of citations	5931	5388	8609
Hirsch factor (*H-index*)	40	39	46

List of 5 most important publications

Authors	Title	Year	Source title	Volume	Art. No.	Page start	Page end	Cited by
Marchisio D.L., Fox R.O.	Solution of population balance equations using the direct quadrature method of moments	2005	Journal of Aerosol Science	36		43	73	643
↑↑ Most cited paper presenting a new method for the solution of the population balance equation for multiphase systems								
Boccardo G., Augier F., Haroun Y., Ferré D., Marchisio D.L.	Validation of a novel open-source work-flow for the simulation of packed-bed reactors	2015	Chemical Engineering Journal	279		809-820	820	72
↑↑ First paper in which the computer graphics software Blender was employed for creating packing of objects for the simulation of catalytic reactors								
Shiea M., Buffo A., Vanni M., Marchisio D.	Numerical Methods for the Solution of Population Balance Equations Coupled with Computational Fluid Dynamics	2020	Annual Review of Chemical and Biomolecular Engineering	11		339	366	11
↑↑ Position paper written under the invitation of the Editor for this prestigious journal (IF=11) on the numerical solution of population balance equations								
Marcato A., Boccardo G., Marchisio D.	A computational workflow to study particle transport and filtration in porous media: Coupling CFD and deep learning	2021	Chemical Engineering Journal	417	128936			7
↑↑ First paper on the use of machine learning for the simulation of flow and transport in porous media								
Ferrari M., Handgraaf J.W., Boccardo G., Buffo A., Vanni M., Marchisio D.	Molecular modeling of the interface of an egg yolk protein-based emulsion	2022	Physics of Fluids	34	021903			0
↑↑ First paper on the use of dissipative particle dynamics for the simulation of food emulsions (mayonnaise in particular)								

List of 25 most cited publications (according to Scopus)

Authors	Title	Year	Source title	Volume	Art. No.	Page start	Page end	Cited by
Marchisio D.L., Fox R.O.	Solution of population balance equations using the direct quadrature method of moments	2005	Journal of Aerosol Science	36		43	73	643
Marchisio D.L., Vigil R.D., Fox R.O.	Quadrature method of moments for aggregation-breakage processes	2003	Journal of Colloid and Interface Science	258		322	334	421
Marchisio D.L., Pikturna J.T., Fox R.O., Vigil R.D., Barresi A.A.	Quadrature method of moments for population-balance equations	2003	AIChE Journal	49		1266	1276	331
Fan R., Marchisio D.L., Fox R.O.	Application of the direct quadrature method of moments to polydisperse gas-solid fluidized beds	2004	Powder Technology	139		7	20	241
Marchisio D.L., Vigil R.D., Fox R.O.	Implementation of the quadrature method of moments in CFD codes for aggregation - breakage problems	2003	Chemical Engineering Science	58		3337	3351	202
Lince F., Marchisio D.L., Barresi A.A.	Strategies to control the particle size distribution of poly-ε-caprolactone	2008	Journal of Colloid and Interface Science	322		505	515	172

	nanoparticles for pharmaceutical applications							
Hussain M., Ceccarelli R., Marchisio D.L., Fino D., Russo N., Geobaldo F.	Synthesis, characterization, and photocatalytic application of novel TiO2 nanoparticles	2010	Chemical Engineering Journal	157		45	51	146
Marchisio D.L., Rivautella L., Barresi A.A.	Design and scale-up of chemical reactors for nanoparticle precipitation	2006	AIChE Journal	52		1877	1887	129
Gavi E., Marchisio D.L., Barresi A.A.	CFD modelling and scale-up of Confined Impinging Jet Reactors	2007	Chemical Engineering Science	62		2228	2241	118
Sanyal J., Marchisio D.L., Fox R.O., Dhanasekharan K.	On the comparison between population balance models for CFD simulation of bubble columns	2005	Industrial and Engineering Chemistry Research	44		5063	5072	117
Zucca A., Marchisio D.L., Barresi A.A., Fox R.O.	Implementation of the population balance equation in CFD codes for modelling soot formation in turbulent flames	2006	Chemical Engineering Science	61		87	95	104
Buffo A., Vanni M., Marchisio D.L.	Multidimensional population balance model for the simulation of turbulent gas-liquid systems in stirred tank reactors	2012	Chemical Engineering Science	70		31	44	99
Bensaid S., Marchisio D.L., Fino D.	Numerical simulation of soot filtration and combustion within diesel particulate filters	2010	Chemical Engineering Science	65		357	363	94
Bensaid S., Marchisio D.L., Fino D., Saracco G., Specchia V.	Modelling of diesel particulate filtration in wall-flow traps	2009	Chemical Engineering Journal	154		211	218	88
Wang L., Marchisio D.L., Vigil R.D., Fox R.O.	CFD simulation of aggregation and breakage processes in laminar Taylor-Couette flow	2005	Journal of Colloid and Interface Science	282		380	396	86
Petitti M., Nasuti A., Marchisio D.L., Vanni M., Baldi G., Mancini N., Podenzani F.	Bubble size distribution modeling in stirred gas-liquid reactors with QMOM augmented by a new correction algorithm	2010	AIChE Journal	56		36	53	78
Buffo A., Vanni M., Marchisio D.L., Fox R.O.	Multivariate Quadrature-Based Moments Methods for turbulent polydisperse gas-liquid systems	2013	International Journal of Multiphase Flow	50		41	57	74
Marchisio D.L., Barresi A.A., Fox R.O.	Simulation of Turbulent Precipitation in a Semi-batch Taylor-Couette Reactor Using CFD	2001	AIChE Journal	47		664	676	74
Boccardo G., Augier F., Haroun Y., Ferré D., Marchisio D.L.	Validation of a novel open-source work-flow for the simulation of packed-bed reactors	2015	Chemical Engineering Journal	279		809-820	820	72
Icardi M., Boccardo G., Marchisio D.L., Tosco T., Sethi R.	Pore-scale simulation of fluid flow and solute dispersion in three-dimensional porous media	2014	Physical Review E - Statistical, Nonlinear, and Soft Matter Physics	90	13032			70
Bensaid S., Marchisio D.L., Russo N., Fino D.	Experimental investigation of soot deposition in diesel particulate filters	2009	Catalysis Today	147		S295	S300	70
Marchisio D.L., Soos M., Sefcik J., Morbidelli M.	Role of turbulent shear rate distribution in aggregation and breakage processes	2006	AIChE Journal	52		158	173	69
Marchisio D.L., Barresi A.A.	CFD simulation of mixing and reaction: The relevance of the micro- mixing model	2003	Chemical Engineering Science	58		3579	3587	67
Petitti M., Vanni M., Marchisio D.L., Buffo A., Podenzani F.	Simulation of coalescence, break-up and mass transfer in a gas-liquid stirred tank with CQMOM	2013	Chemical Engineering Journal	228		1182	1194	59
Zucca A., Marchisio D.L., Vanni M., Barresi A.A.	Validation of bivariate DQMOM for nanoparticle processes simulation	2007	AIChE Journal	53		918	931	59

List of 25 most recent publications

Authors	Title	Year	Source title	Volume	Art. No.	Page start	Page end
Demichelis F., Tommasi T.,	Life cycle assessment and life cycle costing of	2022	Chemosphere	289	133058		

Deorsola F.A., Marchisio D., Mancini G., Fino D.	advanced anaerobic digestion of organic fraction municipal solid waste						
Battaglia G., Romano S., Raponi A., Marchisio D., Ciofalo M., Tamburini A., Cipollina A., Micale G.	Analysis of particles size distributions in Mg(OH)2 precipitation from highly concentrated MgCl2 solutions	2022	Powder Technology	398	117106		
Li D., Marchisio D.	Implementation of CHyQMOM in OpenFOAM for the simulation of non-equilibrium gas-particle flows under one-way and two-way coupling	2022	Powder Technology	396		765	784
Shiea M., Querio A., Buffo A., Boccardo G., Marchisio D.	CFD-PBE modelling of continuous Ni-Mn-Co hydroxide co-precipitation for Li-ion batteries	2022	Chemical Engineering Research and Design	177		461	472
Lavino A.D., Ferrari M., Barresi A.A., Marchisio D.	Effect of different good solvents in flash nano-precipitation via multi-scale population balance modeling-CFD coupling approach	2021	Chemical Engineering Science	245	116833		
Maluta F., Buffo A., Marchisio D., Montante G., Paglianti A., Vanni M.	Numerical and Experimental Analysis of the Daughter Distribution in Liquid-Liquid Stirred Tanks	2021	Chemical Engineering and Technology	44		1994	2001
Sabia C., Frigerio G., Casalini T., Cornolti L., Martinoli L., Buffo A., Marchisio D.L., Barbato M.C.	A detailed CFD analysis of flow patterns and single-phase velocity variations in spiral jet mills affected by caking phenomena	2021	Chemical Engineering Research and Design	174		234	253
Tronci G., Buffo A., Vanni M., Marchisio D.	Validation of the Diffusion Mixture Model for the simulation of bubbly flows and implementation in OpenFOAM	2021	Computers and Fluids	227	105026		
Razza N., Lavino A.D., Fadda G., Lairez D., Impagnatiello A., Marchisio D., Sangermano M., Rizza G.	Nanoprobes to investigate nonspecific interactions in lipid bilayers: From defect-mediated adhesion to membrane disruption	2021	Nanoscale Advances	3		4979	4989
Maniscalco F., Buffo A., Marchisio D., Vanni M.	Numerical simulation of bubble columns: LES turbulence model and interphase forces blending approach	2021	Chemical Engineering Research and Design	173		1	14
Marcato A., Boccardo G., Marchisio D.	A computational workflow to study particle transport and filtration in porous media: Coupling CFD and deep learning	2021	Chemical Engineering Journal	417	128936		
Lauriello N., Kondracki J., Buffo A., Boccardo G., Bouaifi M., Lisal M., Marchisio D.	Simulation of high Schmidt number fluids with dissipative particle dynamics: Parameter identification and robust viscosity evaluation	2021	Physics of Fluids	33	73106		
Maluta F., Buffo A., Marchisio D., Montante G., Paglianti A., Vanni M.	Effect of turbulent kinetic energy dissipation rate on the prediction of droplet size distribution in stirred tanks	2021	International Journal of Multiphase Flow	136	103547		
Li D., Wei Y., Marchisio D.	QEEFoam: A Quasi-Eulerian-Eulerian model for polydisperse turbulent gas-liquid flows. Implementation in OpenFOAM, verification and validation.	2021	International Journal of Multiphase Flow	136	103544		
Romano S., Battaglia G., Bonafede S., Marchisio D., Ciofalo M., Tamburini A., Cipollina A., Micale G.	Experimental assessment of the mixing quality in a circular cross-sectional t-shaped mixer for the precipitation of sparingly soluble compounds	2021	Chemical Engineering Transactions	86		1165	1170
Shiea M., Buffo A., Vanni M., Marchisio D.	Numerical Methods for the Solution of Population Balance Equations Coupled with Computational Fluid Dynamics	2020	Annual Review of Chemical and Biomolecular Engineering	11		339	366
Shiea M., Buffo A., Vanni M., Marchisio D.L.	A novel finite-volume TVD scheme to overcome non-realizability problem in quadrature-based moment methods	2020	Journal of Computational Physics	409	109337		
Li D., Marchisio D., Hasse C., Lucas D.	twoWayGPBEFoam: An open-source Eulerian QBMM solver for monokinetic bubbly flows	2020	Computer Physics Communications	250	107036		
Marcato A., Boccardo G., Marchisio D.L.	A Computational Workflow to Study Particle Transport in Porous Media: Coupling CFD and Deep Learning	2020	Computer Aided Chemical Engineering	48		1759	1764
Frungieri G., Boccardo G., Buffo A., Marchisio D., Karimi-Varzaneh H.A., Vanni M.	A CFD-DEM approach to study the breakup of fractal agglomerates in an internal mixer	2020	Canadian Journal of Chemical Engineering				
Lavino A.D., Carbone P., Marchisio D.	MARTINI coarse-grained model for poly-ε-caprolactone in acetone-water mixtures	2020	Canadian Journal of Chemical Engineering				

Pollack M., Pütz M., Marchisio D.L., Oevermann M., Hasse C.	Zero-flux approximations for multivariate quadrature-based moment methods	2019	Journal of Computational Physics	398	108879		
Li D., Marchisio D., Hasse C., Lucas D.	Comparison of Eulerian QBMM and classical Eulerian–Eulerian method for the simulation of polydisperse bubbly flows	2019	AIChE Journal	65	e16732		
Castellano S., Carrillo L., Sheibat-Othman N., Marchisio D., Buffo A., Charton S.	Using the full turbulence spectrum for describing droplet coalescence and breakage in industrial liquid-liquid systems: Experiments and modeling	2019	Chemical Engineering Journal	374		1420	1432
Gemello L., Plais C., Augier F., Marchisio D.L.	Population balance modelling of bubble columns under the heterogeneous flow regime	2019	Chemical Engineering Journal	372		590	604

10. Teaching activity

Daniele Marchisio has been responsible for teaching the following courses for the Bachelor's (Laurea) and Master of Science's (Laurea Magistrale) degrees at Politecnico di Torino:

- *Academic Year from 2015/2016 to now*
  Fenomeni di trasporto – Transport phenomena (5 ECTS, in Italian)
  Fluidodinamica computazionale – Computational fluid dynamics (5 ECTS, in italian)
  Statistical mechanics for chemical engineers (4 ECTS, in english)
- *Academic Year 2010/2011*
  Dinamica e controllo dei processi chimici – Chemical process dynamics and control (5 ECTS)
  Fluidodinamica computazionale – Computational fluid dynamics (5 ECTS)
- *Academic Year 2009/2010 – 2008/2009*
  Dinamica e controllo dei processi chimici – Chemical process dynamics and control (5 ECTS)
  Sistemi reattivi per micro e nanotecnologie – Reacting systems for micro- and nano-technologies (5 ECTS)
- *Academic Year 2007/2008 – 2006/2007*
  Dinamica e controllo dei processi chimici – Chemical process dynamics and control (5 ECTS)
- *Academic Year 2005/2006*
  Controllo dei processi e strumentazione di controllo – Chemical process control and instrumentation (5 ECTS)
- *Academic Year 2004/2005*
  Analisi e simulazione dei processi industriali – Dynamical simulation of chemical processes (5 ECTS)
- *Academic Year 2003/2004*
  Controllo dei processi chimici – Chemical process control (4 ECTS)

Daniele Marchisio enjoys experimenting in the classroom, mixing formal lectures with hands-on sessions, stimulating active learning by the students. This implies the organization of projects throughout the course, to be carried out by the students, with final group oral presentations. Self-assessment by the students is also encouraged by resorting for example to crowdgrading. The hands-on sessions are carried out in the computer laboratory and focus on the solution of engineering design problems via computational fluid dynamics (using Ansys CFD Fluent) and molecular dynamics (using GROMACS). Students' evaluations (via the anonymous questionnaire filled out at the end of each course) have been always positive, with an average grade of 3.60 (with 1, poor, and 4, excellent, being the minimum and maximum grades respectively).

Torino, 8/2/2022

Daniele Marchisio