

## Curriculum Vitae - Paolo Zunino

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- POSITION**            January 2018 - present *Full Professor in Numerical Analysis* (SC:A05, SSD MAT08)  
MOX - Department of Mathematics, Politecnico di Milano, Italy
- July 2015 - December 2017 *Associate Professor*  
MOX - Department of Mathematics, Politecnico di Milano, Italy
- July 2015 - December 2017 *Adjunct Faculty*  
Department of Mechanical Engineering and Materials Science and at the Department  
of Mathematics, University of Pittsburgh, USA
- January 2012 - June 2015, *Assistant Professor*  
Department of Mechanical Engineering and Materials Science, University of Pittsburgh
- April 2005 - December 2011, *Ricercatore*  
MOX - Department of Mathematics, Politecnico di Milano, Italy
- November 2002 - March 2005, *Postdoctoral Fellow*  
Chair of Modelling and Scientific Computing, Institute of Analysis and Scientific Computing,  
Ecole Polytechnique Fédérale de Lausanne, Switzerland.  
Post. Doc. Advisor: Prof. Alfio Quarteroni.
- December 2002 and February 2003, *Visiting Researcher*  
Biofluid Mechanics Research Group, Prof. Karl Perktold, Graz University of Technology,  
Graz, Austria.
- June 1999 - October 2002, *Research Assistant*  
Chair of Modelling and Scientific Computing, Institute of Analysis and Scientific Computing,  
Ecole Polytechnique Fédérale de Lausanne, Switzerland
- ADDRESS**            Department of Mathematics, Politecnico di Milano  
P.zza L. Da Vinci 32, 20133 Milano, Italy  
voice: +39-02-2399-4530, fax: +39-02-2399-4606  
e-mail: [paolo.zunino@polimi.it](mailto:paolo.zunino@polimi.it)
- EDUCATION**        *Ph.D., Applied Mathematics*, November 2002,  
Chair of Modelling and Scientific Computing (CMCS)  
Institute of Analysis and Scientific Computing (IACS)  
Ecole Polytechnique Fédérale de Lausanne (EPFL)  
Advisor: Prof. Alfio Quarteroni.  
Dissertation: *Mathematical and numerical modelling  
of mass transfer in the vascular system.*
- Master in Aerospace Engineering (100/100 Summa Cum Laude)*, April 1999.  
Politecnico di Milano, Milan, Italy.
- HONORS &  
AWARDS**            Awarded with the *SIAM Outstanding Paper Prize* by the Society for Industrial and  
Applied Mathematics, on July 2004 in Portland, Oregon, for the paper *A Domain  
Decomposition Method for Advection-Diffusion Processes with Application to Blood Solutes*,  
by Alfio Quarteroni, Alessandro Veneziani and Paolo Zunino, appeared in the  
SIAM Journal on Scientific Computing in 2002. The prizes, are given for outstanding  
papers published in SIAM journals.

## PROFESSIONAL EXPERIENCE

- Principal Investigator (Responsabile Nazionale) of the project *Immersed methods for multiscale and multiphysics problems (IMMEDIATE)*, Ministero dell'Università e della Ricerca (MUR) grant no. 022WKWZA8, 1/10/2023-31/9/2025.
- Activity Coordinator of the project *CAL.HUB.RIA (CALabria HUB per la Ricerca Innovativa ed Avanzata)* Piano Operativo Salute (POS) - traiettoria 4, Biotecnologia, bioinformatica e sviluppo farmaceutico - Ministero della Salute, 1/2/2023-31/1/2027
- Local Unit Coordinator of the project *Personalized radiotherapy: incorporating cellular response to irradiation in personalized treatment planning to minimize radiation toxicity (RAD-Precise)* ERA PerMed JTC 2018, 31/5/2019-31/3/2023
- Scientific supervisor of the three year Ph.D. Fellowship sponsored by the Università Italo-Francese. Title: *A new computational approach for fluid-structure interaction of slender bodies*, 1/11/2020-31/10/2023
- Investigator of the project: *Metodi e materiali innovativi per la medicina di precisione e personalizzata NEWMED* supported by Regione Lombardia, 01/02/2020-31/1/2023.
- Co-Investigator of the project: *Modeling the heart across the scales: from cardiac cells to the whole organ* Ministero dell'Istruzione dell'Università e della Ricerca, PRIN 2017, 1/5/2019-30/4/2022.
- Member of the Steering Committee of the project: *iHEART - An Integrated Heart Model for the simulation of the cardiac function*, ERC-AdG-2016 by Prof. Alfio Quarteroni, 1/1/2028-31/5/2023.
- Scientific Coordinator of the project: *Three-dimensional modeling of flow with geochemical and mechanical compaction in sedimentary basins subject to glaciations* supported by ENI s.p.a, 01/09/2016 - 31/12/2018.
- Collaborator of the project *Mechanistic computational modelling of radiation damage to microvasculature and of its effect on tumour microenvironment* Associazione Italiana per la Ricerca sul Cancro, Investigator Grant 2018 by Dr. Tiziana Rancati, 2019 - 2023.
- Co-Investigator of the project *Modellazione numerica di fenomeni idro/geomeccanici per la simulazione di eventi sismici* supported by the (Italian) National Group of Scientific Computing (GNCS), 01/01/2017 - 31/12/2017
- Co-Investigator of the project *Algoritmi e metodi per il problema di interazione fluido-struttura con applicazione alla microcircolazione* supported by the (Italian) National Group of Scientific Computing (GNCS), 01/01/2016 - 31/12/2016
- Co-Investigator of the project *Multiscale Modeling and Simulation of Multiphase Flow in Porous Media Coupled with Geomechanics* supported by the *Department of Energy (DoE, USA)*, Advanced Scientific Computing Research Program, 01/08/2014-31/07/2017.
- Co-Investigator of the project *Host Remodeling of Grafts to Functional Arteries- Translation to Mature Animals* supported by the *National Institute of Health (NIH, USA)*, Heart Lung and Blood Institute: (NHLBI), 01/07/2014 - 30/06/2016
- Co-Principal Investigator of the project: *Analytical and Numerical Study of Two Problems Arising in Solid-Liquid Interaction*, supported by the National Science Foundation (US), Directorate of Mathematical Sciences, 01/08/2013-31/07/2016.
- Principal Investigator of the project: *Computational models for heterogeneous media. Application to microscale analysis of tissue engineered constructs*, supported by Politecnico di Milano, 01/01/2011-31/12/2012.

- Investigator in the ERC Advanced Grant *MATHCARD - Mathematical Modeling and Simulation of the Cardiovascular System*, Project ERC 2008 AdG 227058, directed by A. Quarteroni, Politecnico di Milano, 1/1/2009-31/12/2013.
- Investigator in the project: *Nanobiotechnology - Models and methods for biodegradable materials*, supported by the Italian Institute of Technology, first term 14/06/2006-14/06/2008, second term 15/06/2008-14/06/2011.
- Investigator in the project: *Mathematical models of microstructured materials for drug eluting medical devices*, supported by Fondazione Cariplo, 1/3/2005-28/2/2007.
- Investigator in the project: *ChronoDIAL Project: Modeling and Optimization of Peritoneal Dialysis*. Grant 6169.1 of Swiss National Committee for Technology and Innovation (CTI), in collaboration with Debiotech s.a. (see Industrial Collaborations), 01/01/2003-31/12/2004.
- Investigator in the EU project: *Research Training Network on Mathematical Modeling for Haemodynamics (Haemodel)*, 01/10/2002-30/9/2006.
- Investigator in the project: *Mathematical modeling and numerical simulation of fluid flow and mass transport processes in heterogeneous media*. Grant 21-59330.99 of the Swiss National Science Foundation (FNS), 01/06/2000-31/05/2002.
- Investigator in the project: *ChronoDIAL Project*. Grant 4539.1 of the Swiss National Committee for Technology and Innovation (CTI), 01/06/1999-31/05/2000.

## RESEARCH GRANTS

- PRIN 2022, Title: *Immersed methods for multiscale and multiphysics problems (IMMEDIATE)*, Ministero dell'Università e della Ricerca (MUR) grant no. 022WK-WZA8, 1/10/2023-31/9/2025.
- *ERA PerMed JTC, 2018* Title: *Personalized radiotherapy: incorporating cellular response to irradiation in personalized treatment planning to minimize radiation toxicity (RAD-Precise)*, 31/5/2019-31/3/2023.
- Three-year Ph.D. Fellowship sponsored by the Università Italo-Francese. Title: *A new computational approach for fluid-structure interaction of slender bodies*, 1/11/2020-31/10/2023
- *Three-dimensional modeling of flow with geochemical and mechanical compaction in sedimentary basins subject to glaciations* supported by ENI s.p.a. Role: Scientific coordinator. Duration: 01/09/2016 - 31/03/2018.
- *National Institute of Health (NIH, USA), Heart Lung and Blood Institute: (NHLBI), R21 Grant. Title: Host Remodeling of Grafts to Functional Arteries-Translation to Mature Animals* Role: Co-Investigator with Dr. Anne M. Robertson (PI, contact) and Dr. Yadong Wang (PI) Duration: July 2014 - June 2016
- *Department of Energy (DoE, USA), Advanced Scientific Computing Research Program. Title: Multiscale Modeling and Simulation of Multiphase Flow in Porous Media Coupled with Geomechanics* Role: Co-Investigator with Dr. I. Yotov (PI) Duration: August 2014-July 2017.
- *National Science Foundation (NSF, USA), Directorate of Mathematical Sciences. Title: Analytical and Numerical Study of Two Problems Arising in Solid-Liquid Interaction.* Role: Co-PI with Dr. G.P.Galdi (PI) Duration: August 2013-July 2015.
- *University of Pittsburgh, Hewlett International Grant. Title: Extended finite element methods for free interface problems.* Role: Principal Investigator (PI). Duration: June 2012-May 2013.

**WORKSHOP /  
CONFERENCE  
ORGANIZATION**

- *Politecnico di Milano, 5 per mille Junior*. Title: *Computational models for heterogeneous media. Application to microscale analysis of tissue engineered constructs*. Role: Principal Investigator (PI). Duration: January 2011-December 2012.
- Co-Organizer of the track on *Numerical Methods for Partial Differential Equations* at the Italian National Congress of Mathematics, 4-9 September 2023, Pisa, Italy.
- Co-Organizer of the Minisymposium: *Innovative Modeling and computational approaches for living systems and precision medicine* at the First International Conference on Emerging Technologies in Computational Science for Industry, Sustainability and Innovation M2P 2023 May 30th - June 1st , 2023, Taormina, Italy
- Member of the Scientific Committee of the Workshop MCF2021 *Modelling the Cardiac Function Theory, Numerical Methods, Clinical Applications* 30 September 2 October, Cetraro, Italy, 2022
- Co-Organizer of the Workshop MCF2021 *Modelling the Cardiac Function Theory, Numerical Methods, Clinical Applications* (Online), July 1-3, 2021
- Member of the Local Organizing Committee of the *SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS21)* Online, June 21-24, 2021
- Co-Organizer of the Minisymposium *Mathematical Models and Numerical Methods for the Interaction of Fluid, Poroelastic Media, and Structures* at the SIAM Conference on Mathematical & Computational Issues in the Geosciences (online), June 21-24, 2021
- Co-Organizer of the Invited Session *Coupled partial differential equations across dimensions - discretization approaches and applications* at Coupled 2021 (online) 14-16 June 2021
- Co-Organizer of the Invited Session *Advanced solvers for linear or non-linear poromechanics* at Coupled 2021 (online) 14-16 June 2021
- Member of the Scientific Committee of the Conference *Virtual Physiological Human 2020* (VPH2020) (online) 26-28 August 2020.
- Co-Organizer of the Conference *Modelling of Physiological Flows - the Integrated Heart*, (online) August 31-September 2, 2020.
- Co-Organizer of the Mini-Symposium *Discretizations of mixed-dimensional PDEs* at the European Numerical Mathematics and Advanced Applications Conference (Enumath) 2019, Egmond aan Zee, The Netherlands, October 2019.
- Member of the Scientific Committee of the Workshop *2019 RISM Congress: Modelling the Cardiac Function, iHEART* Varese, Italy, 22-24 July 2019.
- Co-Organizer of the Thematic-session *Mathematical and numerical methods for multi-scale multi-physics, nonlinear coupled processes* at the Interpore Annual Meeting, Valencia, Spain, May 2019.
- Co-Organizer of the Mini-Symposium *Numerical methods for embedded interfaces: applications to geoscience* at the SIMAI National Conference, Rome, Italy, July 2018
- Co-Organizer of the Mini-Symposium *Non-standard Modeling and Discretization Approaches for Multi-physics Phenomena in Porous Media* at the 2nd International Conference on Extended Discretization Methods (XDMS 2017), Umea, Sweden, June 2017

- Co-Organizer of the Mini-Symposium *PoroViscoHyperElastic Computational Models for Geophysic and Biomechanoc Applications* at the 9th International Conference on Porous Media & Annual Meeting (INTERPORE), Rotterdam, Netherlands, May 2017
- Co-Organizer of the Mini-Symposium *PoroViscoHyperElastic Computational Models of Soft Biological Tissue* at the 5th International Conference on Computational and Mathematical Biomedical Engineering (CMBE2017), Pittsburgh, United States, April 2017
- Co-Organizer of the Mini-Symposium *Computationally Guided Design of Cell Culture Bioreactors* at the 5th International Conference on Computational and Mathematical Biomedical Engineering (CMBE2017), Pittsburgh, United States, April 2017
- Co-Organizer of the Mini-Symposium *Smallscale Solid and Fluid Mechanics in Biology I & II* at the SIMAI National Conference, Politecnico di Milano, September 2016
- Co-Organizer of the Mini-Symposium *Geometrically Unfitted Finite Element Methods* at the SIMAI National Conference, Politecnico di Milano, September 2016
- Member of the Scientific Committee of the International Conference Series *X-DMS Extended Discretization Methods* 1st Edition, Ferrara, Italy, 2015 2nd Edition, June 19 - 21, Umea University, Sweden
- Member of the Organizing Committee of the American Physical Society, Division of Fluid Dynamics Annual Meeting, Pittsburgh, November 24-26, 2013
- Member of the Organizing and Committee of the Workshop: *Drug eluting stents, clinical and technological issues*, 9 May 2007.
- Member of the Organizing and Committee of the *3rd International symposium on modeling of physiological flows*, 25-27 September 2006.

## SERVICE

- Co-Editor of ZAMP, Zeitschrift für angewandte Mathematik und Physik Journal of Applied Mathematics and Physics / Journal de Mathématiques et de Physique appliquées, Springer, 2023-p.
- Member of the Editorial Board of *Fluids*, MDPI, 2020-p.
- Member of the Editorial Board of *Mathematics in Engineering*, AIMS Press, 2018-p.
- Member of the Editorial Board of the SEMA SIMAI Springer Series. 2014-p.
- Associate Editor of *Frontiers in Physiology: specialty section of Computational Physiology and Medicine*.
- Review Editor of Frontiers Journals in *Numerical Analysis and Scientific Computation*, in *Computational Physiology and Medicine* and in *Mechanics of Materials*.
- Member of the Graduate Faculty of the Ph.D. Program in *Mathematical Models and Methods for Engineering*, Department of Mathematics, Politecnico di Milano, 2011 - p.
- Vice-Coordinator of the Ph.D. Program *Mathematical Models and Methods for Engineering*, Department of Mathematics, Politecnico di Milano, 2016 - 2021.
- Organizer of the graduate seminar cycle entitled *Three-Rivers Seminar on Fluid Mechanics* (3RSFM), Department of Mechanical Engineering and Materials Science, University of Pittsburgh. Spring Term 2013, Fall Term 2013.
- Member of the Scientific Committee of the *Center for the Nanobiotechnology and Nanomedicine*, Politecnico di Milano, term 2010-2012.

- Member of Ph.D. Final/Overview Defense Committees of the Department of Mechanical Engineering and Materials Science and Department of Mathematics, University of Pittsburgh, 2012-2015.
- Member of the Graduate and Master Thesis Defense Committee for Aerospace, Biomedical and Mathematical Engineers, Politecnico di Milano, 2005-p.

**PROFESSIONAL SOCIETIES** Member of the (American) Society for Industrial and Applied Mathematics (SIAM), of the Italian Mathematical Society (UMI), of the Italian Society for Industrial and Applied Mathematics (SIMAI), of the (Italian) National Group for Scientific Computing (GNCS).

**REVIEWER** Reviewer for the following international scientific journals: Acta mechanica; AMS Mathematical Reviews; American Journal of Neuroradiology; APL bioengineering; Applied and computational harmonic analysis; ASME Journal of Biomechanical Engineering; Archives of Rational Mechanics and Analysis; Biomechanics and Modeling in Mechanobiology; Biomedical Microdevices; Computational Geosciences; Computers & mathematics with applications; Computers and Fluids; Computers and Structures; Computer Methods in Applied Mechanics and Engineering; ESAIM - Mathematical Modelling and Numerical Analysis; Finite elements in analysis and design; IMA Journal of Numerical Analysis; International Journal of Heat and Mass Transfer; International Journal for Numerical Methods in Engineering; International Journal for Numerical Methods in Biomedical Engineering; Journal of the Royal Society Interface; Journal of mathematical fluid mechanics; Journal of Scientific Computing; Journal of Computational and Applied Mathematics; Mathematical Models and Methods in Applied Sciences; Mathematics of Computation; Meccanica; Numerische Mathematik; Philosophical Transactions of The Royal Society A; (SIAM) Multiscale Modeling and Simulation; SIAM Journal on Applied Mathematics; SIAM Journal on Mathematical Analysis; SIAM Journal on Numerical Analysis; SIAM Journal on Scientific Computing;

**INDUSTRIAL COLLABORATIONS**

- 2021 Co-proponent of the project MEGLIO: *A neuroimaging software for the personalized clinical treatment of glioblastoma* among the winners of the Switch to Product (S2P) Innovation Contest 2021 (<https://s2p.it/en/home-s2p-english/>)
- 1999 - 2005, Scientific Consultant of Debiotech s.a. ([www.debiotech.com](http://www.debiotech.com)). Tasks: mathematical and numerical modelling of peritoneal dialysis and insulin pharmacokinetics.
- 2016-2019, Scientific Consultant of ENI s.p.a Tasks: modelling of geomechanical compaction of sedimentary basins.
- 2019-2020, Scientific Collaborator of Deloitte Italia s.r.l. Tasks: certification of academic credentials through the blockchain

**PATENTS** Intellectual property (Inventor), with D. Mastalli and A. Quarteroni, of the patent *Peritoneal dialysis system*, WO Patent App. PCT/IB2007/050,406 <http://www.google.com/patents/WO2007091217A1?cl=en>

**LANGUAGES** Fluent in English and French. First language: Italian.

**PROGRAMMING** Good experience in Matlab, Fortran and C/C++ programming. Good experience with scientific computing and finite element libraries.

## TEACHING

Politecnico di Milano, Teacher/Instructor:

- *Mathematical and Numerical Methods for Engineering*, 45 hours, 150 Students (Biomedical and Nuclear Eng.), fall semester '17/'18, '18/'19, '19/'20, '20/'21, '21/'22, '22/'23.
- *Numerical approximation of partial differential equations for Mathematical Engineers* 35 hours, 150 students, fall semester '07/08, '08/09, spring semester '09/'10, '10/'11, '11/'12, '19/'20, '20/'21, '21/'22, '22/'23, '23/'24;
- *Numerical Analysis for Bioengineers* 35 hours, 100 students, spring semester 15/16, '16/'17, '17/'18, '18/'19.
- *Analytical and Numerical Methods for Mechanical Engineering* 70 hours, 150 students, fall semester 15/16, '16/'17.
- *Numerical methods for Bioengineering*, 45 hours, 100 students, spring semester '07/08, '08/09, fall semester '09/'10, '10/'11, '11/'12.
- *Mathematical and numerical methods for Aerospace Engineers*, 35 hours, 100 students, fall semester '06/07, '07/08, '08/09.

Politecnico di Milano, Teacher/Instructor, Ph.D.courses:

- *Advanced numerical methods for predictive digital twins* 1 module out of 2, 12 hours, a.y. '21/'22, '23/'24.
- *Cardiovascular Mathematics*, 1 module out of 4, 6 hours, a.y. '10/'11, '16/'17, '17/'18, '18/'19, '19/'20.

University of Pittsburgh, Teacher/Instructor:

- *ME2055 Computational Analysis of Transport Phenomena*, graduate level, 40 hours per term, spring term 2015.
- *MEMS0071 Introduction to Fluid Mechanics*, undergraduate level, 40 hours per term, 120 students, fall 2013, spring 2014, fall 2014, spring 2015.
- *MEMS1072 Applied Fluid Mechanics*, undergraduate level, 40 hours per term, 80 students, fall term 2012, spring term 2013.

Politecnico di Milano, Teaching Assistant:

- *Computational Fluid Dynamics for Mathematical Engineers*, 25 hours, 30 students, summer semester '05/06, Instructor: Prof. A. Veneziani.
- *Numerical Analysis for Mathematical Engineers*, 60 hours, 100 students, summer semester '04/05, '05/06, '06/07, Instructor: Prof. A. Quarteroni.

Ecole Polytechnique Fédérale de Lausanne (EPFL), Teaching Assistant:

- *Numerical modelling of the vascular system*, a.y. '02/03, Instructor: Prof. A. Quarteroni.
- *Numerical Analysis*, spring semester '01/02, '00/01, '99/00, Instructors: Prof. L. Formaggia and Prof. A. Quarteroni.
- *Analysis I-III*, EPFL, fall semester '01/02, '00/01, Instructor: Prof. Y. Biollay

**TUTORING  
AND  
SUPERVISION**

**Postdoctoral Advisees**

1. Dr. Nicola R. Franco, November 2022 - present, Department of Mathematics, Politecnico di Milano, Ph.D. in 2023 with Prof. Paolo Zunino, Politecnico di Milano.
2. Dr. Luovica Cicci, November 2021 - October 2022, Department of Mathematics, Politecnico di Milano, Ph.D. in 2022 with Prof. Alfio Quarteroni, Politecnico di Milano.
3. Dr. Daniele Cerroni, January 2017 - 2020, Department of Mathematics, Politecnico di Milano, Ph.D. in 2015 with Prof. Sandro Manservigi, Universit 'a di Bologna.
4. Dr. Arturo Valentn (co-Supervisor with Prof. A.M Robertson), July 2012 - May 2014, University of Pittsburgh, Ph.D. in 2009 with Prof. J. Humphrey at Texas A&M University. **Awards** (while under my advisement):  
**Young Investigator Award in Biomechanics** at The 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013) for the paper, A Predictive Computational Model of Arterial Tissue Equivalent Evolution, A Valentn, X Duan, R Allen, P Zunino, Y Wang, AM Robertson, McGill University, July 23-26, 2013 Montral, Canada, (Extended abstract) Paper ID 718 (2 pages).  
**AHA 2013 Postdoctoral Fellowship** 14POST18890043 (3 mentors: A.M. Robertson, Y. Wang, P. Zunino) Project Title: A predictive computational tool for creating tissue engineered arteries
5. Dr. Joao S. Soares, February 2009 - January 2010, Department of Mathematics, Politecnico di Milano, Italy, Ph.D. in 2008 with K.R. Rajagopal and J. E. Moore, Jr. at Texas A&M University.

**Ph.D. scientific tutor/supervisor:**

1. C. Macaluso, January 2024 - present Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *Data driven and computational modelling of radiation damage on the tumour microenvironment* Role: Ph.D. Supervisor
2. N. Dimola, November 2022 - present Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *Efficient preconditioners for mixed-dimensional PDEs* Role: Ph.D. Supervisor
3. P. Vitullo, November 2021 - present Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *Digital twins for personalized medicine - Application to lab-on-chip for assessing radiotherapy damage* Role: Ph.D. Supervisor
4. F. Lespagnol, November 2020 - present Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *Modeling the interaction of thin structures with fluids* Role: Ph.D. Co-Supervisor with Prof. M.a. Fernandez, INRIA, Paris
5. N.R. Franco November 2019 - 2023, Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *A deep learning approach to reduced order modeling of parameter dependent partial differential equations* Role: Ph.D. Supervisor.
6. N. Barnafi, November 2017 - October 2020 Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *Cardiac poromechanics* Role: Ph.D. Co-Supervisor with Prof. A. Quarteroni and Prof. L. Dede.



7. S. Di Gregorio, November 2017 - October 2020 Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *A multi-physics mathematical and numerical model for the simulation of myocardial perfusion* Role: Ph.D. Co-Supervisor with Prof. A. Quarteroni and Prof. C. Vergara.
8. S. Pozzi, November 2017 - October 2020 Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis *Image-based fluid-structure interaction mathematical models for the simulation of atherosclerosis* Role: Ph.D. Co-Supervisor with Prof. Prof. C. Vergara and Prof. A. Redaelli.
9. F. Laurino, November 2016 - October 2019. Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis on *Hierarchical computational models for predicting the vascular and Extravascular transport of molecules, nanOconstructs and cells in neoplastic tissues*, in collaboration with the Italian Institute of Technology. Role: Ph.D. Supervisor.
10. L. Possenti, November 2015- October 2018. Doctoral Program in Bioengineering, Politecnico di Milano. Ph.D. Thesis: *Modeling of microvasculature in uremic patients*. Role: Ph.D. Co-Supervisor with M.L. Costantino (Ph.D. Supervisor, Department of Chemical Engineering, PoliMi)
11. R. Zakerzadeh, August 2012 - July 2016. Doctoral Program in Computational Modeling and Simulation, University of Pittsburgh. (tentative title) *Computational modeling of fluid-structure interaction with poroelastic materials*, Role: Ph.D. Supervisor.
12. L. Cattaneo, January 2011- March 2014. Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis: *FEM for PDEs with unfitted interfaces: application to flow through heterogeneous media and microcirculation*. Role: Ph.D. Supervisor.
13. S. Minisini, November 2005 - March 2009. Doctoral Program on Mathematical Models and Methods for Engineering, Politecnico di Milano. Ph.D. Thesis: *Mathematical modeling of micro-structured materials for local drug release*. Role: Ph.D. Co-Supervisor with Prof. L. Formaggia (Ph.D. Supervisor)
14. D. Mastalli, December 2002 - January 2006. Doctoral Program in Applied Mathematics, EPFL, Lausanne. Ph.D. Thesis: *Mathematical modeling and optimization of peritoneal dialysis*. Role: Co-Supervisor with Prof. A. Quarteroni (Ph.D. Supervisor).
15. F. Calabrò, January 2002 - April 2005. Politecnico di Milano and Università di Napoli "Federico II" Ph.D. Thesis: *Analysis of time dependent nonlinear problems: existence of solutions and numerical approximation*. Role: Co-Supervisor with Prof. A. Quarteroni (Ph.D. Supervisor).

**Master thesis supervisor:**

1. F. Schweiger, June 2023 - April 2024 M.S. Thesis: *Advancing Tumor Perfusion Analysis: A Homogenization Approach for Microcirculatory Blood Flow Simulation* Role: M.S. Thesis Supervisor.
2. S. Gazzoni, June 2023 - April 2024 M.S. Thesis: *Modelling Phenotypic Heterogeneity in the Tumour Microenvironment: A Computational Approach* Role: M.S. Thesis Supervisor.
3. S. Materne, June 2023 - April 2024 M.S. Thesis: *Development of a Mechanistic Computational Model of the Microvasculature Informed by Patient-Specific Characteristics to Assess Radiotherapy Outcomes* Role: M.S. Thesis Supervisor.

4. R. Montalelli-Eccher, June 2023 - April 2024 M.S. Thesis: *Sensitivity Analysis of Pharmacokinetics in the Tumor Microenvironment* Role: M.S. Thesis Supervisor.
5. A. Colombo, April 2022 - December 2022. M.S. Thesis: *Deep Learning-based Reduced Order Modeling for problems with microstructures* Role: M.S. Thesis Supervisor.
6. A. Gallo, October 2021 - April 2022 M.S. Thesis: *A computational model of tumor microenvironment in fractionated radiotherapy*
7. L. Andreoletti & B. Tadini, April 2020 - October 2021. MOX/LaBS, Politecnico di Milano. M.S. Thesis: *A computational microcirculation model and vascular permeability analysis to assess radiotherapy damages* Role: M.S. Thesis Supervisor.
8. R. Rosati, April 2019 - April 2020. MOX/LaBS, Politecnico di Milano. M.S. Thesis: *A multi-scale computational model for micro-vascular oxygen transfer applied to radiotherapy* Role: M.S. Thesis Supervisor.
9. S. Brambilla, April 2018 - December 2018. MOX, Department of Mathematics, Politecnico di Milano. M.S Thesis: *A posteriori analysis of topological model reduction error, with application to mass transport in microcirculation* Role: M.S. Thesis Supervisor
10. E. Pascucci, April 2018 - December 2018. MOX, Department of Mathematics, Politecnico di Milano. M.S Thesis: *Mathematical and computational model for microcirculation with compliant vessels* Role: M.S. Thesis Supervisor
11. G. Raimondi, April 2017 - December 2017. MOX, Department of Mathematics, Politecnico di Milano. M.S Thesis: *Computational modeling of root water uptake* Role: M.S. Thesis Supervisor.
12. F. M. Gerosa, April 2017 - December 2017. MOX, Department of Mathematics, Politecnico di Milano. M.S Thesis: *Computational models for microcirculation including Fahraeus-Lindqvist and plasma skimming effects* Role: M.S. Thesis Supervisor.
13. A. Tiozzo, April 2016 - July 2017. MOX, Department of Mathematics, Politecnico di Milano. M.S Thesis: *Computational Models for Nanoparticle Transport in the Vascular System* Role: M.S. Thesis Supervisor.
14. D. Notaro, January 2015 - April 2016. MOX, Politecnico di Milano and MEMS, University of Pittsburgh. M.S Thesis: *Mixed Finite Element Methods for Coupled 3D/1D Fluid Problems* Role: M.S. Thesis Supervisor.
15. L. Iannetti and G. Durso, January 2015 - April 2016. MOX/LaBS, Politecnico di Milano and MEMS, University of Pittsburgh. M.S Thesis: *Computational modeling of flow and biochemical transport in a multichamber bioreactor* Role: M.S. Thesis Supervisor.
16. R. Soncini, April 2012 - December 2013. Graduate Program in Mechanical Engineering, University of Pittsburgh. M.S. Thesis: *Parameter estimation via Bayesian inversion: theory, methods and applications.* Role: M.S. Thesis Supervisor.
17. M. Caputo, C. Cianciolo, September 2011 - December 2012. MOX/LaBS, Politecnico di Milano. M.S. Thesis: *Computational analysis of mass transport through stented arteries*, Role: M.S. Thesis Supervisor with Prof. F. Migliavacca and Dr. C. Chiastra and Dr. E. Cutri (Co-Supervisors)
18. L. Cattaneo, C. Colciago, September 2009 - July 2010. MOX, Politecnico di Milano. M.S. Thesis: *Computational modeling of artificial tissue growth*, Role: M.S. Thesis Supervisor.

19. A. Porpora, July 2008 - December 2009. MOX, Politecnico di Milano. M.S. Thesis: *Numerical approximation of defective boundary conditions for hemodynamic flows*, Role: M.S. Thesis Supervisor.
20. A. Conca, January 2008 - July 2009. MOX, Politecnico di Milano, in collaboration with Ducati Motor Holding. M.S. Thesis: *Numerical simulation of the thermal field into internal combustion engines*. Role: M.S. Thesis Supervisor.
21. L. Mella e L. Nebuloni, October 2007 - December 2008. MOX/LaBS, Politecnico di Milano. M.S. Thesis: *Computational study of the interaction between blood flow and drug release from a cardiovascular stent*. **Awarded with the Prize for the Best Master Thesis by the (Italian) Society of Bioengineering, 2009.** Role: M.S. Thesis Supervisor with Prof. F. Migliavacca, Dr. C. D'Angelo (Co-Supervisor)

#### **B.S. thesis supervisor:**

1. E. Schenone, September 2008 - February 2009. MOX, Politecnico di Milano. B.S. Thesis: *Numerical approximation of nonlinear conservation laws by means of Runge-Kutta Discontinuous Galerkin schemes*. Role: B.S. Thesis Supervisor.
2. L. Cattaneo and M. Colgiago, March 2007 - September 2007. MOX, Politecnico di Milano. B.S. Thesis: *Image based estimation of the diffusivity of chemicals in porous materials*. Role: B.S. Thesis Supervisor.
3. M. Martello, March 2007 - September 2007. MOX, Politecnico di Milano. B.S. Thesis: *Projective integration methods for drug release models from stents*. Role: B.S. Thesis Supervisor.
4. A. Bianchessi and M. Dalla Rosa, March 2006 - September 2006. MOX, Politecnico di Milano. B.S. Thesis: *Mathematical modeling of drug release from drug-eluting stents*. Role: Co-Supervisor with Prof. A. Veneziani (Supervisor)
5. L. Walter, September 2004 - January 2005. EPFL, Lausanne. B.S. Thesis: *Adaptive approximation of chaotic differential equations*. Role: B.S. Thesis Co-Supervisor with Dr. E. Burman (Supervisor).

#### **Undergraduate research and internship student supervisor:**

1. G. D'Urso, L. Iannetti, D. Notaro, internship students at University of Pittsburgh from Politecnico di Milano, January 2015 - April 2015.
2. T. Rosalina, internship student at University of Pittsburgh from Eindhoven University of Technology, April 2014 - July 2014.
3. M. Plutt, undergraduate research student, spring term 2014 and fall term 2014, University of Pittsburgh.
4. J. Murphy, undergraduate research student, summer term 2013 and fall term 2013, University of Pittsburgh.
5. L. Cattaneo, G. Iori, internship students at University of Pittsburgh from Politecnico di Milano, February 2013 - April 2013.
6. M. Caputo, C. Cianciolo, internship students at University of Pittsburgh from Politecnico di Milano, October 2012 - November 2012.

## **SEMINARS AND COMMUNICATIONS**

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<sup>1</sup>Seminar classification: i.p. = invited plenary lecture, k.l. = invited keynote lecture, i.s. = invited seminar, i.m. = invited seminar in mini-symposium, c.s. = contributed seminar.

## Plenary/Keynote Lectures at Conferences and Summer Schools

1. Invited Speaker: *Second RISM Congress on PDEs and Continuum Mechanics* Riemann International School of Mathematics, April 10-12 2024 Title: Mixed dimensional PDEs: analysis, approximation and applications.
2. Invited Speaker: *Winter Workshop on FSI problems* Université libre de Bruxelles, January 10-12 2024 Title: Fluid-structure interaction of slender bodies immersed in three-dimensional flows.
3. Invited Speaker: *Workshop on Biophysics-based modeling and data assimilation in medical imaging* WIAS Berlin, August 30 - September 1, 2023 Title: Multiscale models for microcirculation empowered by model order reduction.
4. Invited Speaker: *Scientific Machine Learning* Workshop at the Banff International Research Station, June 18 to June 23, 2023 Banff, Canada. Title: A Deep Learning approach to Reduced Order Modelling of Parameter dependent Partial Differential Equations.
5. Invited Speaker: *Workshop on Computational Mechanics Models on Domains of Heterogeneous Dimensionality* 5-7 October 2022, Split, Croatia Title: Mixed dimensional models for microcirculation.
6. Invited Plenary Speaker: *11th Conference on Applied Mathematics and Scientific Computing*, 5-9 September 2022, Brijuni, Croatia. Title: A Deep Learning approach to Reduced Order Modeling of Parameter dependent Partial Differential Equations.
7. Invited Keynote speaker: *7th International Conference on Computational and Mathematical Biomedical Engineering* 27-29 June 2022, Milano, Italy Title: Mesoscale models of microcirculation.
8. Keynote Speaker: *Mini-symposium (MS10) of the The 8th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress* 5-9 June 2022, Oslo, Norway Title: Analysis and approximation of mixed-dimensional PDEs on 3D-1D domains coupled with Lagrange multipliers.
9. Invited Speaker: *4th One Day Workshop on Applied Mathematics*, 31 May 2022, Bari, Italy Title: Mixed dimensional partial differential equations: analysis, approximation and applications.
10. Invited Plenary Speaker at the *10th Conference on Applied Mathematics and Scientific Computing* 14-18 September 2020, Brijuni, Croatia Title: Mixed dimensional partial differential equations: analysis, approximation and applications.
11. Invited Keynote Speaker: *XXI Congresso dell'Unione Matematica Italiana* 2-7 Settembre 2019, Pavia, Italy Title: Derivation, analysis and approximation of coupled PDEs on embedded manifolds with high dimensionality gap.
12. Plenary speaker: *Diderot Mathematical forum 2016: Biomedical Applications of Mathematics* (Paris, Madrid, Milan). March 15, 2016, Politecnico di Milano, Italy Title: Computational Models for Tissue Perfusion.
13. 5 hour lecture cycle at the *14th LMS-EPSC Summer School in Numerical Analysis on Computational Biology*, July 2010, University of Durham, UK Title: Finite element solution of problems from mathematical biology.
14. Keynote speaker: *2nd International Workshops on Advances in Computational Mechanics, Workshop: Computational biomechanics* 29-31 March, 2010, Yokohama, Japan, Title: Computational modeling of controlled drug release in the cardiovascular system.

15. 3 hour lecture cycle at the *CEA-EDF-INRIA School: Numerical simulation of blood flows* 6-9 December 2005, INRIA, Paris, France Title: Mathematical modelling and simulation of biochemical transport.
16. Plenary Speaker: *ICMS Conference on Computational Modeling in Medicine*. 17-19 September 2003, University of Edinburgh, Edinburgh Title: Mathematical modeling of mass transfer in the vascular system and related clinical applications.

#### Invited Seminars at Workshops and Conference Minisymposia

17. May 30th - June 1st, 2023, Taormina, Italy *First International Conference Math 2 Product (M2P 2023) Emerging Technologies in Computational Science for Industry, Sustainability and Innovation* Title: A Multi-physics reduced order model for the vascular microenvironment (i.m.)
18. March 9th, online *FAU DCN-AvH, Chair for Dynamics, Control and Numerics Seminar Series* Title: A Deep Learning approach to Reduced Order Modeling of Parameter dependent Partial Differential Equations
19. February 26 - March 3, 2023, Amsterdam, the Netherlands, *SIAM Computational Science and Engineering MS66 Reliable and Efficient Methods for Coupled Problems in Porous Media* Title: A deep learning approach to reduced order modeling of partial differential equations for porous media (i.m.)
20. 6 May 2022, online seminar *Gruppo UMI Matematica per l'Intelligenza Artificiale e il Machine Learning* Title: A Deep Learning approach to Reduced Order Modeling of Parameter dependent Partial Differential Equations (i.s.)
21. 29 April 2022, online seminar *Research group on Navier-Stokes equations and fluid-structure interaction* Title: Fluid-structure interaction of slender bodies immersed in three-dimensional flows (i.s.)
22. 22 June 2021, online seminar *8th European Congress of Mathematics MS Modeling, approximation, and analysis of partial differential equations involving singular source terms* Title: Analysis and approximation of mixed-dimensional PDEs on 3D-1D domains coupled with Lagrange multipliers (i.m.)
23. 21 June 2021, online seminar *SIAM Conference on Mathematical & Computational Issues in the Geosciences MS Mathematical and Numerical Methods for Coupled Interface-Driven Mixed-Dimensional Problems* Title: Mixed-Dimensional PDEs on 3D-1D Domains Coupled with Lagrange Multipliers (i.m.)
24. 16 June 2021, online seminar *Society of Mathematical Biology, Annual Meeting MS Deterministic and stochastic models for complex cardiovascular phenomena* Title: A meso-scale computational model for micro-vascular oxygen transfer (i.m.)
25. 18 November 2019, RWTH Aachen University. *School for Simulation and Data Science Seminar Series 2019*. Title: Mixed-dimensional PDEs Analysis, Approximation and Applications (i.s.)
26. 1-4 October 2019, Egmond aan Zee, The Netherlands. *Enumath 2019, MS on Robust discretizations for coupled elliptic/parabolic equations*. Title: Numerical approximation of poromechanic problems with faults and moving boundaries (i.m.)
27. 6-10 May, 2019, Valencia, Spain. *Interpore 2019, MS on Advances on mathematical modeling and numerical simulations of poromechanics*. Title: Multiscale and multiphysics models for geomechanics (i.m.)
28. May 2, 2019, University of Milano, Bicocca. *Nanomedicine 2019*. Title: Mathematical modeling and simulations in nanomedicine (i.s.)

29. 14 February 2019, Oxford, UK. *Mathematical Institute, University of Oxford*. Title: Derivation, analysis and approximation of coupled PDEs on manifolds with high dimensionality gap (i.s.)
30. 26 - 31 August 2018, Oberwolfach, Germany. *Oberwolfach Workshop on Reactive Flows in Deformable, Complex Media*. Title: Computational models for the interaction of fractures and wells in poroelastic materials (i.s.)
31. 11 - 15 June 2018, Glasgow, UK. *ECCOMAS ECCM & ECFD Conference*. Minisymposium: Mathematical and computational modeling of fluid flow and transport in the brain and spinal cord. Title: A computational model for vascular fluid balance at the mesoscale (i.m.)
32. 16 - 18 May , 2018, Como, Italy. *Calcolo scientifico e modelli matematici: alla ricerca delle cose nascoste attraverso le cose manifeste 2.0* Title: Numerical approximation of coupled PDEs on embedded manifolds with high dimensionality gap (i.s.)
33. February 15th, 2018, Montecatini (FI), Italy, *Convegno 2018 del Gruppo Nazionale di Calcolo Scientifico dell'INDAM* Title: Computational models for the interaction of fractures and wells with poroelastic media (i.s.)
34. December 4th 2017, Bergen, Norway, *2nd Workshop on computational aspects of perfusion and flow in live tissue* Title: A computational model of the interaction between microcirculation and tissue interstitium (i.s.)
35. 19 - 21 June, 2017, Umea, Sweden, *2nd International Conference on Extended Discretization Methods (XDMS 2017)* Title: Analysis and approximation of coupled flow problems on bulk and network-shaped domains (i.s.)
36. 8 - 11 May, 2017, Rotterdam, Netherlands *9th International Conference on Porous Media & Annual Meeting (INTERPORE)* Title: Numerical approximation of flow through fractures in poroelastic media (i.s.)
37. 10-12 April 2017, Pittsburgh, United States *5th International Conference on Computational and Mathematical Biomedical Engineering - CMBE2017* Title: A mixed finite element method for modeling the fluid exchange between microcirculation and the tissue interstitium (i.s.)
38. October 2016, Milano, Italy, *Nanomedicine Symposium, Fondazione Centro Europeo di Nanomedicina* Title: Multi-scale and multi-physics approaches for predicting the transport of molecules, nanoconstructs and cells in neoplastic tissues (i.s.)
39. October 2016, Paris, France, *Institut Henri Poincaré, Workshop on Advanced Numerical Methods: Recent Developments, Analysis, and Applications* Title: Numerical approximation of coupled PDEs on manifolds with high dimensionality gap (i.s.)
40. April 2016, Technical University of Munich (TUM), Germany *Lehrstuhl für Numerische Mathematik* Title: Numerical approximation of coupled PDEs with high dimensionality gap (i.s.)
41. January 2016, University College London (UCL), London, UK *Workshop on Geometrically Unfitted Finite Element Methods* Title: Numerical approximation of coupled PDEs on manifolds with high dimensionality gap (i.s.)
42. September 2015, Darmstadt, Germany *International Workshop on Multiscale Models in Mechano and Tumor Biology Modeling, Homogenization, and Applications* Title: An embedded multiscale approach for blood perfusion, drug and heat transport in tumors (i.s.)

43. September 2015, Ferrara, Italy *X-DMS 2015 - eXtended Discretization MethodS*, Minisymposium: Enriched methods for flow and mechanics in heterogeneous porous media. Title: Numerical approximation of coupled PDEs with high dimensionality gap (i.m.)
44. August 2015, Milano, Italy *37TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE Engineering in Medicine and Biology Society* Minisymposium: Mechanobiology Title: Theory and application of arterial tissue in-host remodeling (i.m.)
45. December 8th, 2014, University of Notre Dame, Department of Applied and Computational Mathematics and Statistics, IN, USA. Title: An embedded multiscale approach for studying blood perfusion and drug transport in tumors (i.s.)
46. November 7th, 2014, Carnegie-Mellon University, Department of Civil and Environmental Engineering, PA, USA. Title: An embedded multiscale approach for studying blood perfusion and drug transport in tumors (i.s.)
47. October 20th, 2014, New York University, Department of Mechanical Engineering, NY, USA. Title: A computational study of blood perfusion and drug transport in tumors based on an embedded multiscale approach (i.s.)
48. October 15th, 2014, Pittsburgh, PA, Workshop: *Advancing Research Through HPC* Title: Geometric embedded multiscale methods for the approximation of coupled PDEs with heterogeneous dimensionality (i.s.)
49. August 5th, 2014, The Methodist Hospital Research Institute, Department of Translational Imaging, Houston, TX. Title: A computational study of blood perfusion and drug transport in tumors (i.s.)
50. July 31, 2014, Institute of Computational Engineering and Science (ICES), UT-Austin, TX, Seminar-Subsurface Modeling Series. Title: Computational methods for the interaction of a fluid with a poroelastic material. Partitioning strategies and numerical treatment of embedded interfaces (i.s.)
51. July 6-11th 2014, Boston, USA, *World Congress of Biomechanics*. Minisymposium: Cardiovascular Fluid Mechanics II. Title: A computational model of drug delivery through microcirculation to compare different tumor treatment options (i.s.)
52. June 6th 2014, Civil & Environmental Engineering Seminar, Duke University, NC. Title: XFEM discretization and analysis of steady and time dependent contrast problems (i.s.)
53. May 22-23, 2014, Workshop on Computational Geomechanics, University of Pittsburgh, PA. Title: Computational methods for the interaction of a fluid with a poroelastic material. Partitioning strategies and numerical treatment of embedded interfaces (i.s.)
54. March 27th, 2014, Emory SIAM Student Chapter, Emory University, Atlanta, GA. Title: A computational study of blood perfusion and mass transport in tumors (i.s.)
55. January 20 - 24, 2014, Brown University, Providence, RI, Institute for Computational and Experimental Research in Mathematics (ICERM) Workshop: *From the Clinic to Partial Differential Equations and Back: Emerging challenges for Cardiovascular Mathematics* Title: Computational models for fluid exchange and bio-chemical transport between microcirculation and tissue interstitium. A study of drug delivery strategies to target tumors (i.s.)
56. December 7-10, Orlando, FL, *SIAM conference on Analysis of Partial Differential Equations* Minisymposium: Fluid-Structure Interaction: Analysis, Numerics

- and Applications. Title: Enforcing interface conditions for FSI problems using Nitsche's method. Derivation of explicit coupling strategies for multilayered poroelastic arteries (i.s.)
57. October 28, 2013 to November 01, 2013 *Mathematical Biosciences Institute (MBI) Workshop on Mathematics Guiding Bioartificial Heart Valve Design* Title: Computational modelling of drug eluting cardiovascular stents (i.s.)
  58. October 10th, 2013, *Center for Computational and Integrative Biology*, Rutgers University - Camden, NJ, Title: Analysis of perfusion, microcirculation and drug transport in tumors. A computational study. (i.s.)
  59. July 22-25, 2013, Raleigh, NC, *US National Conference on Computational Mechanics, Minisymposium: Methods for Cut and Composite Meshes: Theory, Algorithms, and Applications*, Title: Analysis of Backward Euler / XFEM Discretization of Parabolic Problems with Moving Interfaces (i.m.)
  60. March 5th, 2013, Pittsburgh, PA, *Computational Math Seminar, Department of Mathematics, University of Pittsburgh*. Title: Some open problems in cardiovascular biomechanics - The intersection of applied mathematics, engineering and biology (i.s.)
  61. February 24-27, 2013, San Diego, CA, *Advances in Computational Mechanics, A Conference Celebrating the 70th Birthday of T.J.R. Hughes. Minisymposium: Biomedical Fluid Mechanics and FSI* Title: Multiscale models for perfusion, microcirculation and drug release (i.m.)
  62. 8-13 July 2012, Sao Paulo, Brazil, *10<sup>th</sup> World Congress on Computational Mechanics (WCCM). Minisymposium: Computational Biomechanics* Title: Computational modeling of drug eluting stents (i.m.)
  63. 5-9 September 2011, Leicester, UK, *ENUMATH 2011. Minisymposium: Numerical methods for biomedical problems* Title: Computational modeling of fluid dynamics and mass transport in the cardiovascular system with application to biomedical devices (i.m.)
  64. 23-25 March 2011, Munich, Germany, *16th International Conference on Finite Elements in Flow Problems (FEF 2011). Minisymposium: Fluid-structure interaction* Title: Numerical treatment of boundary conditions for hemodynamics and FSI modeling (i.m.)
  65. 19-21 January 2011, Milan, Italy, *Workshop on Reduction Strategies for the Simulation of Complex Problems* Title: Numerical strategies for coupling heterogeneous and reduced models. Applications to biological flows and drug release (i.s.)
  66. 11-15 January, 2009, Concepcion, Chile *Third Chilean Workshop on Numerical Analysis of PDEs (WONAPDE 2010), Minisymposium: Numerical Methods for Coupled Multiphysics Problems*. Title: A computational method for coupling blood flow and intramural plasma filtration. Application to drug release from stents. (i.m.)
  67. 2-6 March 2009, Miami, USA, *SIAM Conference on Computational Science and Engineering (CSE09)* Title: The interaction of blood flow and drug release for cardiovascular drug eluting stents. Numerical treatment of net flux boundary conditions. (i.m.)
  68. 30 June - 4 July 2008, Venice, Italy, *8th World Congress on Computational Mechanics, Minisymposium: Biofluids and Coupled Problems in Biomechanics*. Title: The interaction of blood flow and drug release for cardiovascular drug eluting stents. (i.m.)



69. 19-23 May 2008, IPAM-UCLA, Los Angeles, USA, *Workshop on Optimal Transport in the Human Body: Lungs and Blood*. Title: Mathematical and numerical modeling of drug release in the vascular system. (i.s.)
70. 10-14 September 2007, Graz, Austria, *ENUMATH 2007, Minisymposium on Mathematical Modeling in Medicine*. Title: Mathematical models and numerical simulation of drug release from stents. (i.m.)
71. 23-26 July 2007, San Francisco, USA. *9th US National Congress on Computational Mechanics (USNCCM9), Minisymposium on Models and Methods in Computational Vascular and Cardiovascular Mechanics*. Title: Mathematical models and numerical simulation of drug release from stents. (i.m.)
72. 12-13 February 2007, EPFL, Lausanne. *VMS-07 Mini-Workshop on Variational Multiscale Methods and Stabilized Finite Elements*. Title: Weighted Interior Penalties for Mortar and Discontinuous Galerkin Methods. (i.s.)
73. 3-7 July 2006, St. Wolfgang, Austria. *17th International Conference on Domain Decomposition Methods, Minisymposium on Multiphysics Problems*. Title: Domain decomposition methods based on weighted interior penalties. (i.m.)
74. 17 November 2003, INSA, Laboratoire CREATIS, Lyon, France. Title: Mathematical and numerical models for mass transfer aimed to the characterization of the physical properties of the arterial walls. (i.s.)
75. 25-30 August 2003, Ecole Polytechnique Fédérale de Lausanne (1h lecture). *Summer School on Modeling of the Cardiovascular System* Title: Transfer of macromolecules through the arterial wall. From physics to applications. (i.s.)
76. 21-25 July 2003 Berlin, Germany. *15th International Conference on Domain Decomposition Methods, Berlin*. Title: Iterative substructuring methods for advection-diffusion problems in heterogeneous media. (i.m.)
77. 11-14 June 2003, University of Graz, Austria. *Workshop on Cardiovascular, Respiratory and Metabolic Control Modeling*. Title: Mathematical and numerical modeling of mass transfer in the vascular system and related clinical applications. (i.s.)

#### Conference Contributed Seminars

78. November 24 - 26, 2013, Pittsburgh, PA *66th Annual Meeting of the APS Division of Fluid Dynamics* Title: Analysis of perfusion, microcirculation and drug transport in tumors. A computational study. (c.s.)
79. June 11-14, 2013, Chia Laguna, Italy, *5th International Symposium on Modelling of Physiological Flows*, Title: Comparison of explicit coupling strategies for fluid-structure interaction with poroelastic materials (c.s.)
80. 19-20 October 2012, Pittsburgh, PA, USA, *Finite Element Circus (Fall 2012)* Title: XFEM for parabolic problems with moving interfaces (c.s.)
81. 29th June - 1st July 2011, Cardiff, UK, *XFEM 2011. Minisymposium: Error estimation and mathematical aspects* Title: An analysis of extended finite elements for the approximation of large contrast problems (c.s.)
82. 2-4 June 2010, Cagliari, Italy, *4th. International Symposium on Mathematical and Numerical Modeling of Physiological Flows* Title: Multiscale Analysis of Degradable Polymers: from Nanoscale to Macroscale Modeling (c.s.)
83. 28 July - 1 August 2008, Limerick, Ireland, *BAIL 2008, International Conference Boundary and Interior Layers - Computational & Asymptotic Methods*. Title: Discontinuous Galerkin methods based on weighted interior penalties for second order problems with interfaces. (c.s.)

84. 30 June - 4 July 2008, Venice, Italy, *8th World Congress on Computational Mechanics, Minisymposium: Theory and Applications of Discontinuous Galerkin Methods*. Title: A posteriori error estimates for Discontinuous Galerkin methods based on weighted interior penalties. (c.s.)
85. 10-14 September 2007, Graz, Austria, *ENUMATH 2007*. Title: Discontinuous Galerkin methods based on weighted interior penalties. (c.s.)
86. 20-25 November 2005, Prague, Czech Republic. *EMBECE '05, Third European Medical and Biological Engineering Conference*. Title: Mathematical modeling of mass transfer in the vascular system. (c.s.)
87. 3-4 June 2005, Università di Pavia, Pavia, Italy. *The 3rd Finite Element Fair*. Title: Weighted interior penalty methods for non-negative partial differential equations. (c.s.)
88. 30 March - 1 April 2005, Istituto Nazionale di Alta Matematica (INDAM), Rome, Italy. *Control Systems: Theory, Numerics and Applications*. Title: Optimal Control of Peritoneal Dialysis. (c.s.)
89. 2-5 October 2002, Weierstrass Institut, Berlin, Germany. *Challenges in Scientific Computing Conference, CISC2002*. Title: Mathematical and numerical modelling of solute dynamics in blood flow and arterial walls. (c.s.)
90. 2-6 July 2002, Università degli Studi di Milano, Milan. *5th ESMTB Conference on Mathematical Modeling and Computing in Biology and Medicine*. Title: Mathematical and numerical modeling of absorption of chemicals in the arterial wall. (c.s.)
91. 6-8 March 2002 Politecnico di Milano, Milan. *International Workshop - Cardiovascular System: from Mathematical Modeling to Clinical Applications*. Title: Mathematical and numerical modeling of solute dynamics in blood flow and arterial walls. (c.s.)
92. 12-14 October 2000, Il Ciocco, Italy. *AMIF International Conference on Applied Mathematics for Industrial Flow Problems*. Title: Multifield Models for Bio-engineering Applications. (c.s.)

**PUBLICATIONS** ORCID: [orcid.org/0000-0002-2470-0189](https://orcid.org/0000-0002-2470-0189)

GOOGLE database: H Index 35; citations  $\simeq$  4000;

SCOPUS database: H Index 29; citations  $\simeq$  2400;

### Refereed Journals

1. Possenti, L., Vitullo, P., Cichetti, A., Zunino, P., Rancati, T. *Modeling hypoxia-induced radiation resistance and the impact of radiation sources* (2024) *Computers in Biology and Medicine*, 173, art. no. 108334.
2. Vitullo, P., Colombo, A., Franco, N.R., Manzoni, A., Zunino, P. *Nonlinear model order reduction for problems with microstructure using mesh informed neural networks* (2024) *Finite Elements in Analysis and Design*, 229, art. no. 104068.
3. Cicci, L., Fresca, S., Guo, M., Manzoni, A., Zunino, P. *Uncertainty quantification for nonlinear solid mechanics using reduced order models with Gaussian process regression* (2023) *Computers and Mathematics with Applications*, 149, pp. 1-23.
4. L. Heltai, L., Zunino, P. *Reduced Lagrange multiplier approach for non-matching coupling of mixed-dimensional domains* (2023) *Mathematical Models and Methods in Applied Sciences*, 33 (12), pp. 2425-2462.

5. Vitullo, P, Cicci, L, Possenti, L, Coclite, A, Costantino, ML, Zunino, P. *Sensitivity analysis of a multi-physics model for the vascular microenvironment*. Int J Numer Meth Biomed Engng. (2023) ;e3752.
6. Franco, N.R., Fresca, S., Manzoni, A., Zunino, P. *Approximation bounds for convolutional neural networks in operator learning* (2023) Neural Networks, 161, pp. 129-141.
7. Franco, N.R., Manzoni, A., Zunino, P. *A deep learning approach to reduced order modeling of parameter dependent partial differential equations* (2023) Mathematics of Computation, 92 (340), pp. 483-524.
8. Massi, M.C., Franco, N.R., Manzoni, A., Paganoni, A.M., Park, H.A., Hoffmeister, M., Brenner, H., Chang-Claude, J., Ieva, F., Zunino, P. *Learning high-order interactions for polygenic risk prediction* (2023) PLoS ONE, 18, art. no. e0281618.
9. Rota, A., Possenti, L., Offeddu, G.S., Senesi, M., Stucchi, A., Venturelli, I., Rancati, T., Zunino, P., Kamm, R.D., Costantino, M.L. *A three-dimensional method for morphological analysis and flow velocity estimation in microvasculature on-a-chip* (2023) Bioengineering and Translational Medicine.
10. Giulia Pozzi, Beatrice Grammatica, Linda Chaabane, Marco Catucci, Anna Mondino, Paolo Zunino, Pasquale Ciarletta *T cell therapy against cancer: a predictive diffuse-interface mathematical model informed by pre-clinical studies* Journal of Theoretical Biology, 547, art. no. 111172, (2022).
11. N. Barnafi, S. di Gregorio, L. Dedé, P. Zunino, C. Vergara, A. Quarteroni, *A multiscale poromechanics model integrating myocardial perfusion and the epicardial coronary vessels* SIAM Journal on Applied Mathematics, 82 (4), pp. 1167-1193, (2022).
12. Federica Bubba, Benoit Perthame, Daniele Cerroni, Pasquale Ciarletta, Paolo Zunino *A coupled 3D-1D multiscale Keller-Segel model of chemotaxis and its application to cancer invasion* Discrete and Continuous Dynamical Systems - Series S, 15 (8), pp. 2053-2086, (2022).
13. Both, J.W., Barnafi, N.A., Radu, F.A., Zunino, P., Quarteroni, A. *Iterative splitting schemes for a soft material poromechanics model* Computer Methods in Applied Mechanics and Engineering, 388, art. no. 114183, (2022).
14. Di Gregorio, S., Vergara, C., Pelagi, G.M., Baggiano, A., Zunino, P., Guglielmo, M., Fusini, L., Muscogiuri, G., Rossi, A., Rabbat, M.G., Quarteroni, A., Pontone, G. *Prediction of myocardial blood flow under stress conditions by means of a computational model* European Journal of Nuclear Medicine and Molecular Imaging, 49 (6), pp. 1894-1905, (2022).
15. Pozzi, S., Redaelli, A., Vergara, C., Votta, E., Zunino, P. *Mathematical Modeling and Numerical Simulation of Atherosclerotic Plaque Progression Based on Fluid-Structure Interaction* Journal of Mathematical Fluid Mechanics, 23 (3), art. no. 74, (2021).
16. Franco, N.R., Massi, M.C., Ieva, F., Manzoni, A., Paganoni, A.M., Zunino, P., Veldeman, L., Ost, P., Fonteyne, V., Talbot, C.J., Rattay, T., Webb, A., Johnson, K., Lambrecht, M., Haustermans, K., De Meerleer, G., de Ruysscher, D., Vanneste, B., Van Limbergen, E., Choudhury, A., Elliott, R.M., Sperk, E., Veldwijk, M.R., Herskind, C., Avuzzi, B., Noris Chiorda, B., Valdagni, R., Azria, D., Farcy-Jacquet, M.-P., Brengues, M., Rosenstein, B.S., Stock, R.G., Vega, A., Aguado-Barrera, M.E., Sosa-Fajardo, P., Dunning, A.M., Fachal, L., Kerns, S.L., Payne, D., Chang-Claude, J., Seibold, P., West, C.M.L., Rancati, T., REQUITE

- Consortium *Development of a method for generating SNP interaction-aware polygenic risk scores for radiotherapy toxicity* (2021) *Radiotherapy and Oncology*, 159, pp. 241-248.
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