

CURRICULUM VITAE

LUCA FORMAGGIA

Last update: August 15, 2017

OFFICE ADDRESS

MOX, Dipartimento di Matematica

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MAIN BIBLIOMETRY DATA (SOURCE: SCOPUS)

N. of citations: 2372

N. of citations in the last 5 years: 1087

h-index: 22

EDUCATION

09/1978–04/1984 Undergraduate Studies in Mechanical Engineering at Università degli Studi di Padova. Graduated with 110/110 cum laude.

10/1985–10/1986 Master of Science in *Finite Element Methods in Engineering Analysis and Design*, University College of Swansea (UK). Supervisor: Prof. Ken Morgan

01/1987, 07/1989 Ph.D. candidate at the University College of Swansea (UK). Thesis title: *A finite element algorithm for modelling of compressible flow*. Supervisor: Prof. Ken Morgan. External Examiner: Prof. J. Periaux.

PROFESSIONAL CAREER

02/89–09/94 Senior researcher at Alenia Aeronautica, Divisione Velivoli Difesa, Turin, Italy. Computational Aeronautics office.

09/94–06/96 Senior researcher at the Applied Mathematics unit of CRS4 (Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna), Cagliari, Italy

05/98-08/2002 First Assistant to the Chair of Numerical Modelling and Scientific Computing of the Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland

09/2002-01/2006 Associate Professor of Numerical Analysis at Politecnico di Milano, Italy

since 02/2006 Professor of Numerical Analysis at Politecnico di Milano, Italy

MAIN RESEARCH INTERESTS

- *Computational Geophysics.* Numerical modelling of sedimentary basins and oil migration. Reservoir simulation. Flow in fractured porous media.
- *Mathematical modelling and simulation of the cardiovascular system.* Reduced and multi-scale models. Simulation of drug eluting devices.
- *Mesh adaptation for the finite element method.* Anisotropic error estimates. Mesh generation and adaptation.
- *Numerical solution of fluid flow problems.* Fluid-structure interaction problems. Dynamics of boats.

MAIN TEACHING ACTIVITY

(the number of student is indicative. Number of hours refers to teaching.)

Politecnico di Milano

<i>A. Y.</i>	<i>hours</i>	<i>St.</i>	<i>Title</i>
<i>2002-03</i>	<i>20</i>	<i>40</i>	Esercise session for the course <i>Metodi Matematici per l'Ingegneria</i> for engineering students. Lecturers : S. Salsa e A. Quarteroni
	<i>72</i>	<i>320</i>	<i>Calcolo Numerico A.</i> B.Sc Aeronautical Engineering.
<i>2003-04</i>	<i>36</i>	<i>160</i>	<i>Calcolo Numerico.</i> B.Sc. Mechanical Engineering.
	<i>36</i>	<i>160</i>	<i>Calcolo Numerico A.</i> B.Sc. Aeronautical Engineering.
<i>2004-05</i>	<i>36</i>	<i>60</i>	<i>Metodi Analitici e Numerici per l'Ingegneria.</i> BSc Mechanical Engineering.
	<i>36</i>	<i>160</i>	<i>Calcolo Numerico A.</i> First year of Aerospace Engineering.
<i>2005-06</i>	<i>36</i>	<i>60</i>	<i>Metodi Analitici e Numerici per l'Ingegneria.</i> BSc Mechanical Engineering.
	<i>36</i>	<i>160</i>	<i>Calcolo Numerico A.</i> BSc Aerospace Engineering.
	<i>36</i>	<i>40</i>	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> Master in Mathematical Engineering.
<i>2006-07</i>	<i>36</i>	<i>60</i>	<i>Metodi Analitici e Numerici per l'Ingegneria.</i> BSc Mechanical Engineering.
	<i>36</i>	<i>160</i>	<i>Calcolo Numerico A.</i> BSc Aerospace Engineering.
	<i>36</i>	<i>40</i>	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> Master in Mathematical Engineering.

2007-08	52	150	<i>Modellistica Numerica di Problemi Differenziali.</i> Master in Aerospace Engineering
	36	160	<i>Calcolo Numerico A.</i> BSc Aerospace Engineering.
	36	40	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> Master in Mathematical Engineering.
2008-09	52	150	<i>Modellistica Numerica di Problemi Differenziali.</i> Master in Aerospace Engineering
	36	40	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> First/second year of Master study in Mathematical Engineering.
	12	10	<i>Ph.D. Course on Optimal Control of PDE's</i> Mathematical Engineering Ph.D. School
2009-10	52	150	<i>Modellistica Numerica di Problemi Differenziali.</i> Master in Aerospace Engineering
	36	40	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> Master in Mathematical Engineering.
	12	10	<i>Ph.D. Course on Optimal Control of PDE's</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering
	28	10	<i>Ph.D. Course on Advanced programming techniques for scientific computing</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering
2010-11	44	150	<i>Modellistica Numerica di Problemi Differenziali.</i> Master in Aerospace Engineering
	70	20	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> Master in Mathematical Engineering.
	12	10	<i>Ph.D. Course on Optimal Control of PDE's</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering
2011-12	44	50	<i>Modellistica Numerica di Problemi Differenziali.</i> Master in Aerospace Engineering
	70	20	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> Master in Mathematical Engineering.
	8	5	<i>Ph.D. Course on Cardiovascular Mathematics</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering
2012-13	44	50	<i>Modellistica Numerica di Problemi Differenziali.</i> Master in Aerospace Engineering
	70	20	<i>Programmazione Avanzata per il Calcolo Scientifico.</i> Master in Mathematical Engineering.
	8	5	<i>Ph.D. Course on Cardiovascular Mathematics</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering
2013-14	46	50	<i>Modellistica numerica per problemi differenziali.</i> Master in Aerospace Engineering
	70	30	<i>Programmazione Avanzata per il calcolo scientifico.</i> Master in Mathematical Engineering.
	8	5	<i>Ph.D. Course on Cardiovascular Mathematics</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering

2014-15	44	150	<i>Numerical modelling of differential problems.</i> Master in Aerospace Engineering
	70	20	<i>Advanced programming for scientific computing.</i> Master in Mathematical Engineering.
	6	8	<i>Ph.D. Course on Cardiovascular Mathematics</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering
	8	10	<i>Ph.D. Course on Numerical methods for engineering applications</i> Ph.D. School on Architecture and building engineering
2015-16	44	150	<i>Numerical modelling of differential problems.</i> Master in Aerospace Engineering
	70	20	<i>Advanced programming for scientific computing.</i> Master in Mathematical Engineering.
	6	8	<i>Ph.D. Course on Cardiovascular Mathematics</i> Ph.D. School on Mathematical and Numerical Modelling in Engineering
2016-17	44	150	<i>Numerical modelling of differential problems.</i> Master in Aerospace Engineering
	70	20	<i>Advanced programming for scientific computing.</i> Master in Mathematical Engineering.

EPFL

<i>A. Y.</i>	<i>hours</i>	<i>St.</i>	<i>Descr.</i>
98-99	14	100	Exercise session of the course <i>Analyse Numerique</i> for engineering students
	23	20	Course on <i>Scientific Computing</i> at the "Master Course on Mathematical Engineering", EPFL e École Polytechnique de Paris. (10 h. of lectures and 13 of exercise sessions)
	13	20	Esercise session of the course <i>Scientific Computing</i>
99-00	14	30	Esercise session for the course on <i>Mathematical Modelling</i>
	14	100	Esercise session of the course on <i>Numerical Analysis</i> for engineers and physicists
	23	20	Lecures on <i>Scientific Computing</i> for the "Master Course on Mathematical Engineering", EPFL e École Polytechnique de Paris. (10 hours of lectures and 13h of exercise sessions)
00-01	14	30	Esercise sessions for the course on <i>Mathematical Modelling of the Cardiovascular System</i> for the Mathematics students.
	23	20	Lectures on <i>Scientific Computing</i> for the "Master Course on Mathematical Engineering", EPFL e École Polytechnique de Paris. (10 hours of lectures and 13h of exercise session)
	28	100	Semester course on <i>Numerical Analysis</i> for the Civil Engineering and Physicists. EPFL and University of Lausanne
01-02	28	100	Semester course on <i>Numerical Analysis</i> for Civil Engineering

	23	20	Lectures on <i>Scientific Computing</i> for the "Master Course on Mathematical Engineering", EPFL e École Polytechnique de Paris. (10 hours of lectures+13h exercise sessions)
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RESPONSIBILITIES IN SCIENTIFIC OR ACADEMIC ORGANIZATIONS

- Since February 2017, President of SIMAI (Italian Society of Industrial and Applied Mathematics).
- Since April 2009, member of the Managing Board (Consiglio Direttivo) of SIMAI (Italian Society of Industrial and Applied Mathematics) with the role of Secretary.
- Since January 2014, head of the MOX Laboratory of the Department of Mathematics of Politecnico di Milano
- 06/96-05/98 Head of the CFD unit of CRS4 (Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna), Cagliari, Italy

ACADEMIC RESPONSIBILITIES

- 2017- Member of the National Commission for Scientifica Habilitation (ASN) for the scientific sector of Numerical Analysis.
- 2014- Member of the Board of the Department of Mathematics of Politecnico di Milano.
- 2011 Member of the selection committee for the Doctoral School on Mathematical Models and Methods in Engineering, Politecnico di Milano
- 2009- member of the Scientific Committee of the Department of Mathematics of Politecnico di Milano
- 2008- Member of the Faculty Board of the Doctoral School on Mathematical Models and Methods in Engineering (Modelli e Metodi Matematici per l'Ingegneria).
- 2007-2009, Responsible for the student internships for the course on Mathematical Engineering, Politecnico di Milano.
- 2007. Member of the selection committee for the Doctoral School on Mathematical Engineering (Ingegneria Matematica), Politecnico di Milano, (XXIII ciclo)
- 2009. Member of the selection committee for the Doctoral School on Mathematical Models and Methods in Engineering (modelli e Metodi Matematici per l'Ingegneria), Politecnico di Milano, (XXV ciclo)
- 2007-2008 Member of the Managing Board of the Doctoral school on Mathematical Engineering (Ingegneria Matematica), Politecnico di Milano.

EDITORIAL ACTIVITIES

- Chief Editor of the SEMA-SIMAI Springer Series on Applied and Industrial Mathematics (since 2012)
- Member of the Editorial Board of the SIAM Journal of Scientific Computing (SISC) (since January 2011).

- Member of the Editorial Board of the International Journal for Numerical Methods in Biomedical Engineering
 - Member of the Advisory Board of the International Journal for Numerical Methods in Fluids
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SCIENTIFIC REFEREEING ACTIVITIES

- Reviewer for the American Mathematical Society (AMS)
 - Reviewer of several journals on numerical analysis and scientific computing, among which Computer Methods in Applied Mechanical Engineering, Journal of Computational Physics, International Journal for Numerical Methods in Engineering, International Journal for Numerical Methods in Fluids, Mathematical Modelling and Numerical Analysis, SIAM Journal of Scientific Computing.
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CONFERENCE ORGANIZATION

- Member of the Technical Committee of the *Eighth International Conference of Finite Elements in Fluids*, 1995
- Member of the Technical Committee della *Ninth International Conference of Finite Elements in Fluids*, 1996
- Member of the Organising Committee of the Workshop on *Parallel Computing in Applied Fluid Mechanics*, Scuola Normale di Pisa, 1997
- Member of the Organising Committee of the *Second AMIF Conference*, Il Ciocco, Italy, 2000
- Member of the Organising Committee of the Workshop on *Cardiovascular System: from Mathematical Modelling to Clinical Applications*, Milan, 6-8 March 2002.
- Member of the Scientific Committee of the *First International Symposium on Modelling of Physiological Flows*, Lausanne, Switzerland, 1-3 September 2003.
- Member of the Organising Committee of the Workshop *Integrazione di Sistemi Complessi in Biomedicina, Modelli Simulazioni, Rappresentazioni*. Bergamo, Italy, 22-24 November 2004.
- Member of the Scientific Committee of the *Second International Symposium on Modelling of Physiological Flows*, Sesimbra, Portugal, 31/03-2/04 2005.
- member of the Local Organizing Committee of the *8th World Congress of Computational Mechanics (WCCM8)* and the *Fifth European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS 2008)*, Venice, Italy, 30/06-4/07 2008.
- member of the *International Advisory Committee* of the *First International Conference on Computational and Mathematical Biomedical Engineering*, Swansea, UK, June 29th-July 1st 2009.
- Member of the Scientific Committee of the *4th International Symposium on Modelling of Physiological Flows*, Cagliari, Italy, June 2-3, 2010.
- Member of the Scientific Committee of *SIMAI 2012*, Torino, Italy, June 25-28, 2012
- Member of the Scientific Committee of the *SIAM Conference on the Mathematical and Computational Issues in the Geosciences (GS13)*, Padova, Italy, June 17-20, 2013

- Member of the International Program Committee of the *19th IMACS World Congress*, El Escorial-Maria Cristina, Spain August 26-30, 2013.
- Member of the Scientific Committee of the *First Joint International Meeting RSME-SCM-SEMA-SIMAI-UMI*, Bilbao. June 30- July 4, 2014.
- Member of the Scientific Committee of SimRace, Conference on numerical methods and High Performance Computing for industrial fluid flows IFPEN / Rueil-Malmaison - 8-10 December 2015
- Member of the Scientific Committee of the Ecomas Conference X-DMS of Extended Discretization Methods, Ferrara (Italy), 9-11 September 2015
- Head of the Organizing Committee of the SIMAI 2016 Biannual Congress, Milano (Italy), 13-16 September 2016
- Member of the Scientific Committee of the Ecomas X-DMS 2017 Conference of Extended Discretization Methods, Umea (Sweden), 19-21 June 2017

SUPERVISION ACTIVITY

Supervision of PhD Thesis

1. A. Bulgalho de Moura, *The Geometrical Multiscale Modelling of the Cardiovascular System: Coupling 3D FSI and 1D Models*, Mathematical Engineering, Politecnico di Milano, Italy, 2008.
2. Sara Minisini, *Mathematical and numerical modeling of drug eluting stents*, Mathematical Engineering, Politecnico di Milano, Italy, 2009.
3. Andrea Mola, *A model for the dynamics of high performance rowing boats*.Mathematical Engineering, Politecnico di Milano, Italy, 2009
4. Andrea Villa, *Three dimensional geophysical modeling: from physics to numerical simulation*, Applied Mathematics, Università degli studi di Milano, Italy, 2009
5. Anna Scotti, *Models for oil generation and primary migration*, Mathematical Engineering, Politecnico di Milano, Italy, 2009
6. Alessio Fumagalli, *Numerical modelling of flows in fractured media by the XFEM method*, Mathematical Models and Methods for Engineering, Politecnico di Milano, 2012.
7. Matteo Pischiutta, *Mathematical and numerical modelling of the evolution of mixtures of sand in aeolian dunes*, Mathematical Models and Methods for Engineering, Politecnico di Milano, 2012.
8. *HPC simulation of sedimentary basins*, Mathematical Models and Methods for Engineering, Politecnico di Milano, Nur Fadel, 2013.
9. Alessandro Melani, *Adjoint-based parameter estimation in human vascular one dimensional models*, Mathematical Models and Methods for Engineering, Politecnico di Milano, 2013.
10. *Numerical models for fracture evolution*, Mathematical Models and Methods for Engineering, Politecnico di Milano, Bianca Giovanardi, on going.
11. Davide Baroli, *Multiscale models for heterogeneous Darcy's flows*, Mathematical Models and Methods for Engineering, Politecnico di Milano, 2015.

12. Stefano Zonca, Mathematical Models and Methods for Engineering, Politecnico di Milano, on going.
13. Bianca Giovanardi, Mathematical Models and Methods for Engineering, Politecnico di Milano, on going.
14. Daquin Liu, Mathematical Models and Methods for Engineering, Politecnico di Milano, on going.
15. Florent Chave, PhD student in co-sharing with Prof. Di Pietro of University of Montpellier, France. PhD grant by a Vinci France Italy Scholarship. on going.

Reviewer/external examiner of the following PhD Thesis:

1. *Hybrid Grids Methods for the Numerical Solution of the Navier-Stokes Equations Around Complex Three-Dimensional Configurations*, Li Yenzung DIC, Aeronautics Department, Imperial College, London. Supervisor: D. Doorly. A.Y. 96-97.
2. *Modelisation, analyse mathématique et applications numériques de problèmes d'interaction fluid-structure instationnaires*. Paul Metier, Université Pierre et Marie Curie, Paris VI. Supervisor: Yvon Maday. 2003.
3. *Reduced basis modeling of hierarchical flow systems*. Alf Emil Lovgren, Department of Mathematical Sciences, Norwegian University of Science and technology, Trondheim, Norway. Supervisor: E.M. Rønquist. 2005.
4. *Réduction variationnelle d'un couplage fluids-structure. application à l'hémodynamique*. Nicole Poussineau, Université Pierre et Marie Curie, Paris VI. Supervisor: Yvon Maday. 2007.
5. *Multiscale modelling of metabolism and transport phenomena in living tissues*. Carlo D'Angelo, chaire de modélisation et calcul scientifique, section de mathématiques, EPFL, Lausanne, Switzerland. Supervisor: Alfio Quarteroni. 2007.
6. *Parallel Mesh Adaptive Techniques for Complex Flow Simulation*. Angelo Casagrande, Laboratoire d'ingénierie numérique, EPFL, Switzerland. Programme doctoral en mécanique. Supervisor: Penelope Leyland. 2008.
7. *A high order splitting method for time dependent domains*, Tormod, Bjøntegaard, Department of Mathematical Sciences, Norwegian University of Science and technology, Trondheim, Norway. Supervisor: E.M. Rønquist. 2008.
8. *An object-oriented and high-performance platform for aerothermodynamics simulation*. Andrea Lani, Von Karman Institute, Belgium. Supervisor: Herman Deconinck. 2008.
9. *Adaptation de maillage anisotrope 3D multi-échelles et ciblée à une fonctionnelle pour la mécanique des fluides. Application à la prédiction haute-fidélité du bang sonique*. Adrien Loseille, Université Pierre et Marie Curie et INRIA Roquencourt, Paris VI. Supervisor: Frederic Alauzet. 2008.
10. *The Fixed-Mesh ALE method applied to multiphysics problems using stabilized formulations*, Joan Baiges, Universitat Politècnica de Catalunya, Supervisor: Ramon Codina, 2010.
11. *Computational Inverse Scattering Via Qualitative Methods*, Riccardo Aramini, University of Trento, Supervisor: Andrea Massa and Michele Piana, 2011
12. *Aérodynamique instationnaire et méthode adjointe*, Anca Belme, INRIA Sophia-Antipolis and University of Bordeaux, Supervisor: Alain Dervieux, 2011.

13. *Simulation Dynamique des systemes bateau-remeurs*, Francois, Rongere, University of Nantes, Supervisor: Jean Michel Kobus, 2011
14. *Anisotropic metric-based mesh adaptation for unsteady CFD simulations involving moving geometries*, Geraldine Olivier, Université Pierre et Marie Curie et INRIA Roquencourt, Paris VI. Supervisor: Frederic Alauzet. 2012.
15. *Vers la simulation des écoulements sanguins*, Vincent Chabbanes, Université de Grenoble, July 2013
16. *Parallel algorithms and efficient implementation techniques for finite element approximations*, Radu Popescu, EPFL, September 2013.
17. Joubine Aghili, University of Montpellier, France, 2016
18. Maya Groza, University of Nice, France, 2016.

KEYNOTE AND PLENARY TALKS AT INTERNATIONAL CONFERENCES

1. *Implementation of a 3D explicit Euler solver on a Cray computer.* **Keynote Lecture**, Fourth International Symposium on Science and Engineering on Cray Supercomputers, 12-14 October 1988, Minneapolis Minnesota.
2. *Mesh generation and adaption strategies for Euler and Navier-Stokes equations.* **Keynote Lecture**. Workshop on Grid Adaptation in Computational PDE's: Theory and Applications, Edimbrough, July 1996.
3. *Some anisotropic mesh adaption strategies for the FEM.* **Keynote Lecture**. Chemnitz-FEM Symposium 2002, Chemnitz, Germania, 23-25 September 2002.
4. *Multiscale modelling of the cardiovascular system.* **Keynote Lecture**. Second International Symposium on Modelling of Physiological Flows, 31st March-2nd April 2005, Sesimbra, Portugal.
5. *Fluid-structure interaction problems in free surface flows: application to boat dynamics.* **Keynote lecture**. ICFD06, Conference on Numerical Methods for Fluid Dynamics, University of Reading, 26-29 March 2007
6. *Numerical models for the evolution of geological basins and oil generation.* **Plenary Lecture** for the SIMAI 2010 conference, Cagliari, Italy, June 22nd 2010
7. *Numerical models for the simulation of the cardiovascular system,* **Plenary Lecture** at the INI/WIMCS meeting on Computational challenges in PDEs, Swansea, UK, April 4-8, 2011.
8. *The challenge of complexity in sedimentary and reservoir simulations,* **Keynote lecture**, ACME-UK 2015. 23rd Conference on Computational Mechanics, 8-10 April 2015, Swansea, UK.
9. **Plenary lecture** at the first joint Brazil-Italy meeting in Mathematics, Rio de Janeiro, 29 August, 2nd September 2016
10. **Plenary lecture** at the ECMI 2016 Conference. 13-17th June 2016. Santiago de Compostela, Spain.
11. **Invited lecture** at the Gordon Research Conference on Flow and Transport in Porous Media, July 31-August 5, 2016

12. **Plenary Lecture** at the XDMS 2017 conference on eXtended Discretization MethodS for partial differential equations on complex and evolving domains. 19-21 June 2017, Umea, Sweden.
 13. **Invited Lecture** at POEMS 2017, Polytopal Element Methods in Mathematics and Engineering, 5-7 July 2017, University of Milano-Bicocca, Italy.
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PARTICIPATION TO RESEARCH PROJECT

Supported by National or European research financing bodies

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| 10/93-09/95 | Participation to: E.U. BRITE AER20031 <i>ECARP: European Computational Aerodynamics Project</i> . Coordinated by British Aerospace. Subject: mesh adaptation of the Euler Equations. |
| 06/96-05/98 | Participation to: E.U. ESPRIT PCI-II <i>PCECOWATER</i> Subject: development of parallel solvers for free surface flows with environmental applications. |
| 06/97-05/98 | Participation to: E.U. EU-1063, HPPC-SEA <i>VIVA: The Virtual Vascular Project</i> . Subject: Development of a Navier-Stokes solver. |
| 02/00-01/02 | Participation to: E.U. BRPR-CT97-0591 <i>IdeMAS: Industrial Demonstrator of Accurate and Efficient Multidimensional Upwind and Multigrid Algorithms for Aerodynamic Simulations on Unstructured Grids</i> . Coordinated by Prof. Deconinck, Von Karman Institute for Fluid Dynamics, Belgium. |
| 09/00-08/02 | Participation to: FNS (Fond National Suisse) project <i>Multimodels and multidomains methods for fluid structure interaction problems</i> . Principal coordinator: Prof. A. Quarteroni. |
| 09/00-08/03 | Participation to: FNS (Fond National Suisse) project <i>Mathematical Modelling and Numerical Simulation of Fluid Flow and Mass Transport Processes in Heterogeneous Media</i> . Principal coordinator: Prof. A. Quarteroni. |
| 09/98-08/00 | Participation to: FNS (Fond National Suisse) project <i>Domain Decomposition and Adaptive Methods: Analysis, Development and Applications</i> . Principal coordinator: Prof. A. Quarteroni. |
| 01/02-06/03 | Participation to: E.U./OFES BRPR-CT97-0591. Continuation of <i>IdeMAS:Industrial Demonstrator of Accurate and Efficient Multidimensional Upwind and Multigrid Algorithms for Aerodynamic Simulations on Unstructured Grids</i> , Coordinator: Prof. Deconinck, Von Karman Institute for Fluid Dynamics, Belgium. |
| 01/02-12/05 | Co-responsible of: FNS (Fond National Suisse) project <i>Techniques hybrides et adaptives pour la simulation complexe</i> , with P. Leyland, EPFL Lausanne. |
| 01/01-12/02 | Participation to: Project MCB: <i>Multiscale Computing in Biofluidynamics</i> funded by Politecnico di Milano. Coordinator: Prof. A. Quarteroni. |
| 01/00-09/00 | Co-responsible of the CTI (Commission Technologie et Industrie) project <i>ChronoDial</i> on the development of a mathematical model of biochemical exchanges in peritoneal dialysis, with Prof. A. Quarteroni. |
| 09/01-03/03 | Participation to: CNR Progetto Agenzia 2000. <i>Modelling Fluid Structure Interaction in the arterial System</i> . Coordinator: Prof. A. Quarteroni. |

- 01/02-12/05 Participant and local contact of E.U. HPRNCT-2002-002670 *HaeMOdel: Modelling the Cardiovascular System*. Main coordinator: Prof. A. Quarteroni. The project involved 6 European University and was coordinated by Politecnico di Milano.
- 01/03-12/04 Participation to: MURST Cofin 2003 *Numerical simulation of the cardiovascular system and Error estimation and mesh adaptivity for finite elements*. Coordinated by Prof. Quarteroni.
- 01/04-12/05 Participation to: MURST Cofin 2004 *Multiscale models and methods*. Coordinated by Prof. F. Brezzi, CNR-IMATI, Pavia, Italy.
- 06/04-05/05 Participation to: INDAM (Italian Institute for High Mathematics) project *Integrazione di sistemi complessi in biomedicina: modelli, rappresentazioni, simulazioni..* Coordinator: Alfio Quarteroni.
- 02/06-01/08 Participation to: MIUR PRIN05 project *Numerical models in fluid dynamics with application to the cardiovascular system and to the environment*. Coordinator: A. Quarteroni.
- 03/04-02/06 Participation to: *Interazione Fluido Struttura: comportamento aeroelastico con metodologie sperimentali e numeriche*, financed by Politecnico di Milano. Coordinator: Prof. G. Diana.
- 03/05-02/07 Co-responsible of: *Modellistica Matematica di Materiali Microstrutturati per Dispositivi a Rilascio di Farmaco*, project financed by Fondazione Cariplo, Italy. Participants: MOX, LaBS (Politecnico di Milano), Department of Chemistry (University of Bologna). With A. Quarteroni and L. Formaggia.
- 10/08-9/10 Participation to: MIUR PRIN07. *Mathematical and numerical modelling for cardiovascular and fluid dynamics applications*. Coordinator: Alfio Quarteroni.
- 06/06-05/11 Participation to: *Nanobiotechnology models and methods for local drug delivery from nano/micro structured materials*. Project financed by the Italian Institute of Technology (IIT). Coordinator: Alfio Quarteroni.
- 01/09-12/13 Coordination of the Politecnico unit of *MathCard* ERC advanced grant. Grantee: Prof. A. Quarteroni.
- 10/11-10/12 Participation to: MIUR PRIN09. *Numerical methods for scientific computing and advanced applications*. Coordinator: Alfio Quarteroni.
- 03/14- Coordination of: MIUR PRIN12. *Mathematical and numerical modelling of the cardiovascular system and clinical applications*.
- 2016 Coordinator of the IHP Trimester on Numerical Methods for PDEs, Institute Henry Poincaré, Paris, France, 5 September-16 Decembre 2016. With D. di Pietro and A. Ern.

Directly financed by Industries

- 2004-05 Coordinator, with S. Micheletti of the project *Glow1D* and *Glow2D*. Financed by Federal Mogul Inc. Subject: numerical models for the simulation of a diesel engine glow plug. Development of an original finite element code for the related electro-thermal interaction problem.
- 2005-07 Participation to *Steam2D*. Project financed by Eni S.p.A. on the mathematical and numerical modelling of sedimentary basins. Coordinators: Alfio Quarteroni and Fausto Saleri.

2007-	Coordination, with A. Quarteroni, of <i>Steam3D</i> and <i>Pmod+</i> , two research projects financed by Eni S.p.A. on the mathematical and numerical modelling of sedimentary basins and oil generation and primary migration. Development of original numerical methods and software.
2003-08	Coordinator of the projects <i>Kime</i> and <i>Rowing</i> . Financed by Filippi Lido S.r.L. Subject: Development of a dynamics model competition rowing boats.
2008-10	Coordinator, with Piercesare Secchi, of the project <i>Microseepage</i> . Financed by Eni S.p.A. Subject: models of transport of hydrocarbons in sands.
2008-	Coordinator, with Stefano Micheletti, of the project <i>Eni-Imaging</i> , financed by Eni S.p.A. Subject: novel numerical methods to support seismic imaging.
2008-10	Coordinator, with Gianni Arioli, of the project <i>RUM</i> , financed by Altran Italia. Subject: Development of tools for the management of uncertainties in the design of oil pipes.
2009-	Coordinator with N. Parolini of the MOX activity within the project EnerGIT, financed by Regione Lombardia, Italy, on the development of green data centers.
2009-2015	Scientific manager of the general contract by the Mathematics Department of Politecnico di Milano and Eni spa on the development and implementation of numerical method applied to oil field prospection and exploitation.
2013-2015	Scientific manager of the general contract by the Mathematics Department of Politecnico di Milano and MOXOFF srl.
2013-2014	Scientific coordinator of a project in collaboration with Nolan group on the development of numerical tools for bettering the comfort of a motorcycle helmet, crash analysis and vibro-acoustics.
2013-2015	Principal coordinator of the project KAFRES upscaling on the development of upscaling techniques for fractured reservoirs. Financed by Eni spa.
2013-2014	Coordinator of the project SIMBA-GE on the development and implementation on GPUs of numerical techniques for the simulation of oil generation and expulsion in source rocks. Financed by Eni spa.
2014	Principal coordinator of the project KAFRES gridding on the development of mesh generation techniques for fractured reservoirs. Financed by Eni spa.
2014-2015	Coordinator of the project GEOMECH on fault reactivation and induced seismicity. Financed by Eni spa.

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