

# CURRICULUM VITÆ ET STUDIORUM

## Alessandra Aimi, PhD

Department of Mathematics and Computer Science  
University of Parma  
Parco Area delle Scienze, 53/A  
43124 Parma - ITALY

Tel: (+39) 0521 906944  
Fax: (+39) 0521 906950  
E-mail: [alessandra.aimi@unipr.it](mailto:alessandra.aimi@unipr.it)  
Homepage: <http://www.anum.unipr.it/>

### PERSONAL DATA

Place and date of birth: Fidenza (PR), April 22<sup>nd</sup>, 1967.  
Citizenship: italian.  
Civil status: married, 3 children.  
Place of residence: Via Magellano 54, Fidenza (PR).

### ACADEMIC POSITION

- **Since October 1<sup>st</sup>, 2014:** Associate Professor in Numerical Analysis, working at Mathematics and Computer Science Department of Parma University.

### PREVIOUS POSITIONS AND GRANTS

- **From 16/11/1997 to 30/09/2014:** Assistant Professor in Numerical Analysis, working at Mathematics and Computer Science Department of Parma University.

- **From 1/11/1994 to 31/10/1997:** financially supported PhD student in *Computational Mathematics and Operational Research* at the University of Milano (X cycle).

- **From 1/1/1992 to 31/10/1994:** E.U.L.O. (Ente Universitario della Lombardia Orientale) grant holder, for research and teaching activities in Numerical Analysis at Engineering Faculty of Brescia University.

### EDUCATION

- **1998: PhD in Computational Mathematics** with a thesis entitled: “*New numerical integration schemes for the solution of (hyper)singular integral equations with galerkin BEM*” (supervisor: Prof. Mauro Diligenti).

-**1990: Graduated (summa cum laude) in Mathematics** at Parma University, with a dissertation entitled: “*Un’applicazione del metodo degli invarianti ortogonali all’operatore dell’elasticità in un rettangolo*” (supervisors: Prof. Lucilla Bassotti Rizza, Prof. Mauro Diligenti).

### ATTENDANCE TO WORKSHOPS, SUMMER SCHOOLS AND SPECIALIZATION COURSES

- Workshop IWATA “International Workshop on Approximation Theory and Applications”, Rifreddo (Potenza), September 12-13, 2013
- Workshop GNCS “Accoppiamento di metodi numerici per BIEs e PDEs relative a problemi evolutivi esterni e multistrato”, Torino Polytechnic, February 18-19, 2013
- Workshop “BEM on the Saar 2012”, Saarland University, Saarbrücken, May 14-16, 2012
- Workshop GNCS “Tecniche numeriche per problemi di propagazione di onde elastiche in multidomini”, Parma University, January 31, 2012
- Workshop “Time Domain Boundary Integral Equations: Algorithms, Analysis, Applications”, Max Plank Institute for Mathematics in the Sciences, Leipzig, May 4-6, 2011
- Workshop “Space-time Boundary Integral Equation Methods for Wave Propagation Problems”, Torino Polytechnic, September 9, 2010
- Workshop “Integral Equations: recent numerical developments and new applications”, Parma University, October 29-30, 2009
- DWCAA09, 2nd Dolomites Workshop on Constructive Approximation and Applications, Alba di Canazei (Trento), September 4-9, 2009
- International Workshop “Advanced Numerical Methods in Seismology”, Brescia University, November 17, 2008
- Workshop “Equazioni Integrali: recenti sviluppi numerici e nuove applicazioni”, Parma University, September 27-28, 2007
- SIMAI Meeting on Applied Mathematics development perspectives in Italy, Parma University, May 18-19, 2007
- Workshop “Algebra Lineare Numerica e Applicazioni”, Padua University, February 26-27, 2007
- Workshop “Algebra Lineare Numerica e Applicazioni”, Pisa University, January 31- February 1, 2002
- Workshop “Teoria dell’approssimazione nell’ambito della risoluzione numerica di equazioni differenziali e integrali”, Cortona, September 25-29, 1995
- International Workshop “Recent advances in Numerical Methods for P.D.E.”, Torino Polytechnic, February 14-16, 1995
- “XII Scuola di Matematica Computazionale”, Vico Equense, September 7-15, 1994
- “XI Scuola di Matematica Computazionale”, Vico Equense, September 15-25, 1993
- “X Scuola di Matematica Computazionale”, Maratea, September 2-12, 1992
- “Corso Express”, presso ACS, Milano, December 2-4, 1992
- “Tutorial course on Domain Decomposition Methods”, Pavia University, June 11-13, 1992

## **ATTENDANCE TO NATIONAL AND INTERNATIONAL CONGRESSES**

- SMART 2014, Pontignano (Siena), 28 September-1 October 2014
- ICNAAM 2014, Rodi (Grecia), 22-28 September 2014
- WCCM XI, Barcelona (Spain), July 20-25, 2014
- GNCS-INdAM Congress, Montecatini Terme, February 19-20, 2014
- BETEQ 2013, International Conference on Boundary Element Techniques, Paris, July 16-18 2013
- Waves 2013, Gammarth (Tunisia), June 3-7, 2013
- GNCS-INdAM Congress, Montecatini Terme, November 15-16, 2012
- ECCOMAS 2012, 6th European Congress on Computational Methods in Applied Sciences and Engineering, Wien (Austria), September 10-14, 2012

- SIMAI 2012, XI National Congress, Torino, June 25-28, 2012
- SC2011, International Conference on Scientific Computing, S. Margherita di Pula, Cagliari, October 10-14, 2011
- XIX UMI Congress, Bologna, September 12-17, 2011
- IABEM 2011, Brescia, September 5-8, 2011
- ICNAAM 2010, Rodi (Grecia), September 19-25, 2010
- X SIMAI Congress, Cagliari, June 21-25, 2010
- ECCM 2010, IV European Conference on Computational Mechanics, Paris (France), May 16-21, 2010
- CMMSE 2009, 9<sup>th</sup> International Conference on Computational and Mathematical Methods in Science and Engineering, Gijon (Spain), June 30 –July 3, 2009
- Waves 2009, Pau (France), June 15-19, 2009
- GNCS-INdAM Congress, Montecatini Terme, February 3-5, 2009
- IX SIMAI Congress, Rome, September 15-19, 2008
- GNCS-INdAM Congress, Montecatini Terme, February 4-6, 2008
- XVIII AIMETA National Congress, Brescia, September 11-14, 2007
- BETEQ 2007, International Conference on Boundary Element Techniques, Naples, July 24-26, 2007
- IABEM 2006, Symposium of the International Association for Boundary Element Methods, Graz (Austria), July 10-12, 2006
- VIII SIMAI Congress, Baia Samuele (Ragusa), May 22-26, 2006
- XVII AIMETA National Congress, Florence, September 11-15, 2005
- NAC 2005, International Conference of Numerical Analysis, Arcavacata di Rende, May 19-21, 2005
- VII SIMAI Congress, Venice, September 20-24, 2004
- ICCAM 2002, Tenth International Congress on Computational and Applied Mathematics, Leuven (Belgium), July 22-26, 2002
- IABEM 2002, Symposium of the International Association for Boundary Element Methods, Austin (Texas), May 28-30 2002
- XV AIMETA National Congress, Taormina, September 26-29, 2001
- A4A4, The Fourth International Symposium on Algorithms for Approximation, Huddersfield (UK), July 15-20, 2001
- IABEM 2000, Symposium of the International Association for Boundary Element Methods, Brescia, July 4-7, 2000
- V SIMAI National Congress, Ischia Porto, June 5-9, 2000
- IABEM International Symposium on Boundary Element Methods, Ecole Polytechnique, Palaiseau (Parigi), May 26-29, 1998
- National Congress of Numerical Analysis, Montecatini Terme, April 15-17, 1998
- IABEM Symposium: *Fundamental solutions in Boundary Elements: formulation and integration*, Seville (Spain), June 18-20, 1997
- XII AIMETA National Congress, Naples, October 3-6, 1995
- II SIMAI National Congress, Anacapri, May 31-June 3, 1994

## **SCIENTIFIC COMMUNICATIONS**

(The asterisk \* denotes personally presented talks)

- **2014\***: “Isometric Analysis and Symmetric Galerkin BEM: a 2D numerical study”, SMART 2014

- **2014\***: “Energetic BEM-FEM coupling for the numerical solution of the damped wave equation”, *ICNAAM 2014*
- **2014\***: “Numerical analysis of the damped wave equation by “energetic” formulations”, *WCCM XI*
- **2014**: “Analysis of Damped Waves Using Energetic BEM-FEM Coupling”, *BeTeq 2014*
- **2014\***: “Metodi fast per la risoluzione numerica di sistemi di equazioni integro-differenziali”, *GNCS-INdAM 2014 Congress*
- **2013\***: “Energetic BEM-FEM for 2D wave propagation problems”, *IWATA 2013*
- **2013**: “Energetic BEM-FEM coupling for wave propagation in layered media”, *BeTeq 2013*
- **2013\***: “Energetic BEM-FEM coupling for wave propagation in unbounded domains”, *Waves 2013*
- **2013**: “BEM-FEM coupling for the one-dimensional Klein-Gordon equation”, *Waves 2013*
- **2013**: “Platonic Solids, Restrictions Matrices and Space-Time Energetic Galerkin BEM”, *Waves 2013*
- **2013\***: “Accoppiamento di metodi numerici per BIEs e PDEs relative a problemi evolutivi esterni e multistrato”, *GNCS Workshop*
- **2012\***: “Accoppiamento di metodi numerici per BIEs e PDEs relative a problemi evolutivi esterni e multistrato”, *GNCS-INdAM 2012 Congress*
- **2012**: “Restriction matrices for exploiting symmetry in 3D wave propagation analysis by Energetic BEM”, *ECCOMAS 2012*
- **2012\***: “An energetic approach to BEM-FEM coupling for wave propagation phenomena”, *XI SIMAI Congress*
- **2012**: “A stable energetic Galerkin BEM for 3D wave propagation interior problems”, *XI SIMAI Congress*
- **2012\***: “An energy based BEM-FEM coupling for wave propagation problems: first results”, *Workshop “BEM on the Saar”*
- **2011\***: “On the regularization of Galerkin BEM hypersingular bilinear forms”, *SC2011*
- **2011\***: “Un metodo BEM energetico di tipo Galerkin per problemi di propagazione di onde”, *XIX UMI Congress*
- **2011**: “On the energetic Galerkin BEM applied to 3D wave propagation problems”, *IABEM 2011*
- **2011**: “Variational formulation for the energetic approach to 2D wave propagation boundary integral equations”, *IABEM 2011*
- **2011\***: “Energetic Galerkin BEM and domain decomposition for 2D wave propagation problems in multi-layered media”, *Workshop “Time Domain Boundary Integral Equations: Algorithms, Analysis, Applications”*
- **2010**: “Energetic Galerkin BEM for 2D wave propagation problems in piecewise homogeneous media”, *ICNAAM 2010*
- **2010**: “Multi-domain BEM for two dimensional problems of wave propagation”, *X SIMAI Congress*
- **2010**: “Exploiting geometrical symmetries in space-time BIEs discretization”, *ECCM 2010*
- **2009**: “Efficient numerical integration schemes for the discretization of hypersingular BIEs related to wave propagation problems”, *DWCAA09 Workshop*
- **2009**: “Numerical integration schemes for the discretization of BIEs related to wave propagation problems”, *IX CMMSE Conference*
- **2009**: “Developments in Boundary Element Methods for Wave propagation problems”, *GNCS Congress*
- **2008**: “Boundary element methods for earthquake simulations: an introduction”, *International Workshop “Advanced Numerical Methods in Seismology”*
- **2008**: “An energy approach for time-domain boundary integral formulations of the wave equation”, *IX SIMAI Congress*

- **2008:** “On analytical integrations and time marching schemes in 3D BEM elastodynamics”, *Workshop “BEM on the Saar”*
- **2008:** “A space-time energetic approach for BEM related to wave propagation analysis”, *Workshop “BEM on the Saar”*
- **2008:** “A space-time energetic approach for BEM related to wave propagation analysis in layered media”, *GNCS Congress*
- **2007\*:** “An energetic space-time weak formulation for BIEs related to the wave problem”, *Workshop “Equazioni Integrali: recenti sviluppi numerici e nuove applicazioni”*
- **2007:** “Space-time variational formulations for BIEs related to the wave problem”, *XVIII AIMETA Congress*
- **2007:** “Numerical results for the wave propagation problem with space-time boundary element method”, *XVIII AIMETA Congress*
- **2007:** “Numerical results of one-dimensional wave propagation analysis in layered media”, *BETEQ 2007*
- **2007:** “Remarks on space-time variational formulations for BIEs related to the wave problem”, *BETEQ 2007*
- **2007:** “One-dimensional wave propagation analysis in layered media by BEMs”, *SIMAI Meeting 2007*
- **2006\*:** “Numerical Integration Schemes for Petrov-Galerkin Infinite BEM”, *IABEM 2006 Conference*
- **2006\*:** “Numerical approximation of a BGK-type relaxation model for reactive mixtures”, *VIII SIMAI Congress*
- **2006\*:** “Numerical Integration Schemes for hypersingular integrals on the real line”, *VIII SIMAI Congress*
- **2005:** “BEM simulations over unbounded domains”, *XVII AIMETA National Congress*
- **2004\*:** “Restriction Matrices and Panel Clustering Method for multi-domain SGBEM”, *VII SIMAI Congress*
- **2003:** “Restriction Matrices and Domain Decomposition Method for SGBEM Applications”, *XVI AIMETA National Congress*
- **2002\*:** “Groups Representation Theory and Restriction Matrices”, *ICCAM X*
- **2002\*:** “Restriction Matrices for SGBEM Application”, *IABEM 2002 Conference*
- **2002:** “Use of panel clustering method in numerical-analytical schemes for 3D SGBEM”, *VI SIMAI National Congress*
- **2001:** “A panel clustering algorithm for 3D SGBEM with analytical inner integrations in elasticity”, *XV AIMETA National Congress*
- **2001\*:** “Geometrical symmetry and restriction matrices”, *XV AIMETA National Congress*
- **2001\*:** “Geometrical Symmetry in Symmetric Galerkin BEM ”, *International Symposium ALGORITHMS FOR APPROXIMATION IV*
- **2000\*:** “Numerical integration in 3D Galerkin BEM solution of HBIEs”, *IABEM 2000*
- **2000\*:** “Hypersingular kernel integration in 3D Galerkin boundary element method”, *SIMAI National Congress*
- **1998\*:** “Nuovi schemi di integrazione numerica per la risoluzione di equazioni integrali (iper)singolari con il metodo di Galerkin agli elementi di contorno”, *National Congress of Numerical Analysis*
- **1998\*:** “Some results on analytical and numerical integration in 3D Galerkin BEM solution of HBIEs”, *IABEM International Symposium on Boundary Elements Method*
- **1997\*:** “Numerical integration schemes for evaluation of (hyper)singular integrals in 2D BEM”, *IABEM Workshop-Fundamental solutions in Boundary Elements: formulation and integration*
- **1995\*:** “Applications of the h-p version of symmetric boundary element method”, *XII AIMETA National Congress*

- **1994\***: “Analisi di due algoritmi per la risoluzione in parallelo di problemi ellittici al contorno”, *II SIMAI National Congress*

## **RECENT INVITED CONFERENCES**

- **8th January 2014**: “Energetic BEM-FEM coupling for the numerical solution of wave propagation problems in unbounded multi-domains”, *Department of Mathematics and Computer Science, University of Florence*
- **27th May 2013**: “Energetic BEM-FEM coupling for wave propagation in unbounded media”, *MOX Seminars, Polytechnic of Milan*
- **November 2011**: “An energy approach to space-time Galerkin BEM for exterior wave propagation problems”, *INRIA, Monthly POEMS Seminars, Rocquencourt (Paris)*
- **September 2010**: “An energy approach to space-time Galerkin BEM for wave propagation problems”, *Workshop “Space-time Boundary Integral Equation Methods for Wave Propagation Problems”, Torino Polytechnic*

## **SCIENTIFIC PARTICIPATION / RESPONSIBILITY RELATED TO INTERNATIONAL AND NATIONAL RESEARCH PROJECTS, SELECTED FOR FUNDING ON THE BASIS OF COMPETITIVE CALLS INVOLVING PEER REVIEW**

- **GNCS 2014 (12 months)**: “Dall’Approssimazione all’Algebra Lineare: metodi numerici per l’Analisi Isogeometrica” (**participant**)
- **GNCS 2013 (12 months)**: “Metodi fast per la risoluzione numerica di sistemi di equazioni integro-differenziali” (**responsible**)
- **GNCS 2012 (12 months)**: “Accoppiamento di metodi numerici per BIEs e PDEs relative a problemi evolutivi esterni e multistrato” (**responsible**)
- **GNCS 2011 (12 months)**: “Tecniche numeriche per problemi di propagazione di onde elastiche in multidomini” (**responsible**)
- **PRIN 2009 (24 months)**: “Tecniche numeriche BEM per problemi di propagazione di onde elastiche” (**participant** to Parma Unit – Local responsible: Prof. M. Diligenti)
- **PRIN 2007 (24 months)**: “Tecniche numeriche BEM per problemi di propagazione di onde elastiche” (**participant** to Parma Unit – Local responsible: Prof. M. Diligenti)
- **PRIN 2004 (24 months)**: “Teorie cinetiche in presenza di fenomeni non conservativi” (Parma Unit: resp. Prof. G. Spiga)
- **PRIN 2003 (24 months)**: “Metodi computazionali ad alta accuratezza nell’elettromagnetismo e nella modellizzazione ambientale” (**participant** to Torino Polytechnic Unit – Local responsible: Prof. G. Monegato)
- **PRIN 2000 (24 months)**: “Trattamento numerico di modelli alle derivate parziali aventi soluzioni irregolari e/o strutturate” (**participant** to Torino Polytechnic Unit – Local responsible: Prof. C. Canuto)
- **PRIN 1998 (24 months)**: “Trattamento numerico di modelli alle derivate parziali avanti soluzioni irregolari” (**participant** to Torino Polytechnic Unit – Local responsible: Prof. C. Canuto)

## **INVITED PARTICIPATION IN FOREIGN AND INTERNATIONAL HIGH QUALITY ORGANISATIONS AND RESEARCH INSTITUTES**

- **November 2011**: INRIA, Rocquencourt (Parigi)

## **ACTIVITY AS A REVIEWER**

For various international scientific journals, among which:

- Applied Mathematics and Computation
- Communications in Nonlinear Sciences and Numerical Simulation
- Computational Mechanics
- Computer Methods in Applied Mechanics and Engineering
- CMES: Computer Modeling in Engineering and Sciences
- Engineering Analysis with Boundary Elements
- International Journal for Numerical Methods in Engineering
- Journal of Computational and Applied Mathematics
- Journal of Scientific Computing
- Mathematical Methods in the Applied Sciences

I'm also a Reviewer for

- Mathematical Review

## **RESEARCH TOPICS**

The main topics of my research are:

**1. Galerkin Boundary Element Method (Galerkin BEM).** After a considerable experience, firstly gained in the years of PhD studies, in the field of numerical solution of elliptic boundary value problems via symmetric integral reformulation, more recently I started to address the study of wave propagation problems, reformulated in terms of boundary integral equations directly in space-time domain. After a careful analysis of the few weak formulations of these integral problems existing in literature, a new weak formulation has been introduced, related to the energy of the differential model, which led in the discretization phase to the so-called "Energetic Galerkin BEM". The first applications of this method concerned elastodynamics one-dimensional problems and 2D and 3D wave propagation problems. Then, this approach has been extended to multi-domain problems, numerically solved by Energetic Galerkin BEM and Domain Decomposition technique. Now I'm studying an energetic BEM-FEM coupling technique applied to the numerical resolution of wave propagation problems in presence of damping phenomena: in this context, stability and convergence theoretical results have been recently obtained.

**2. Numerical integration schemes for double integrals with weakly singular, strongly singular (Cauchy principal value integrals) and hyper-singular (Hadamard finite part integrals) kernels,** involved in the definition of the elements of linear systems related to discretizations made by Symmetric Galerkin BEM (SGBEM), based on approximating piecewise polynomial functions of arbitrary local degree. Using product quadrature formulas of interpolatory type for logarithmic or rational kernels, a Radau type formula for the approximation of Hadamard finite part integrals and a formula for the approximation of integrals of analytic functions in the interval of integration with weak singularities at the endpoints, numerical integration schemes for 2D problems were introduced in literature, that allow the evaluation of the linear system of Galerkin BEM discretization with the usual FEM technique, i.e. working element by element on the decomposition of boundaries with piecewise regular parametric representation. These numerical quadrature schemes only require the

user to define a mesh, not necessarily uniform, on the boundary and to specify the local degree of the approximated solution. Moreover, they are actually suitable for the construction of  $h$ -,  $p$ -,  $h$ - $p$ , also adaptive, versions of SGBEM. Exploiting the results of convergence of basic quadrature formulas, the consistency analysis of the introduced numerical schemes has been developed and asymptotic estimates for the integration error were obtained. To check the efficiency of these quadrature schemes several numerical simulations on potential, linear elasticity, fracture mechanics problems have been performed: the agreement between the numerical results and accuracy estimates, well known in literature, was excellent. Later on, the above numerical integration schemes have been extended to Galerkin BEM for 3D problems which obviously have, compared to the previous ones, a significantly greater difficulty level: in fact, one must numerically evaluate four consecutive one-dimensional integrals each having integrand functions with particular singularity. Further, the above quadrature schemes for 2D problems have been reconsidered, on one hand with the aim of analyzing their efficiency in the field of Galerkin BEM for interface problems (on multi-domains), the other with the aim to extend their use to the numerical resolution, by means of Petrov-Galerkin method, of boundary integral equations coming from the reformulation of elliptic problems defined on unbounded domains with unbounded boundary, such as potential and linear elasticity problems defined of half-planes, unbounded quadrants, infinite strips.

**3. Reformulation, in a discrete framework, of the Decomposition into Subspaces method, through the introduction of appropriate restriction matrices** that allow a reduction of computational cost in the discretization phase of 2D and 3D, static or dynamic, problems, in their differential or integral formulation, having some symmetry properties. In particular, these restriction matrices decompose the linear systems coming from the finite element (FEM) or the boundary element (BEM) discretization into independent linear sub-systems of reduced size to be possibly solved in parallel. In case of partial symmetry properties of the problem, they are able to provide excellent preconditioners. Some topics studied at the beginning of my scientific activity, such as numerical evaluation of eigenvalues of mathematical physics operators and parallel computing on transputers networks, have to be understood in the context of the Decomposition into Subspaces method.

## SCIENTIFIC PRODUCTION

### Research papers (on Scientific Journals or Books with Referees):

- [40AR] **A.Aimi, G.Buffoni, M.Groppi**: “Decomposition of a planar vector field into irrotational and rotational components”, *Appl. Math. Comp.*, **244**, 63-90, (2014)
- [39AR] **A.Aimi, L.Desiderio, M.Diligenti, C.Guardasoni**: “A numerical study of energetic BEM-FEM applied to wave propagation in 2D multidomains”, *Publications de l'Institut Mathématique*, **96** (110), 5–22, (2014)
- [38AR] **A.Aimi, S.Panizzi**: “BEM-FEM coupling for the 1D Klein-Gordon equation”, *Numerical Methods for Partial Differential Equations***30** (6), 2042-2082, (2014)
- [37AR] **A.Aimi, M.Diligenti, A.Frangi, C.Guardasoni**: “Energetic BEM-FEM coupling for wave propagation in 3D multidomains”, *Internat. j. Numer. Methods Engrg.*, **97**, 377–394, (2014)
- [36AR] **A.Aimi, S.Panizzi**: “On the regularization of bilinear forms with hypersingular kernel”, *Appl. Comput. Math.*, **12** (2), 184-210, (2013)



- [35AR] **A.Aimi, M.Diligenti, A.Frangi, C.Guardasoni:** “Neumann exterior wave propagation problems: computational aspects of 3D energetic Galerkin BEM”, *Comp. Mech.*, DOI: 10.1007/s00466-012-0796-5, **51**, 475-493, (2013)
- [34AR] **A.Aimi, M.Diligenti, C.Guardasoni, S. Panizzi:** “Energetic BEM-FEM coupling for wave propagation in layered media”, *Communications in Applied and Industrial Mathematics*, **3**, No. 2, 1-21, (2012)
- [33AR] **A.Aimi, M.Diligenti, A.Frangi, C.Guardasoni:** “A stable 3D energetic Galerkin BEM approach for wave propagation interior problems”, *Engineering Analysis with Boundary Elements*, **36**, 1756-1765, (2012)
- [32AR] **A.Aimi, M.Diligenti, C.Guardasoni:** “Restriction matrices in space-time energetic BEM”, *Engineering Analysis with Boundary Elements*, **36**, 1256-1271, (2012)
- [31AR] **A.Aimi, S.Gazzola, C.Guardasoni:** “Energetic boundary element method analysis of wave propagation in 2D multilayered media”, *Mathematical Methods in the Applied Sciences*, **35**, 1140-1160, (2012)
- [30AR] **A.Aimi, S.Gazzola, C.Guardasoni:** “Energetic BEM for domain decomposition in 2D wave propagation problems”, *Communications in Applied and Industrial Mathematics*, **2** No.1, 1-22, (2011)
- [29AR] **A.Aimi, M.Diligenti, C.Guardasoni:** “Numerical integration schemes for applications of energetic Galerkin BEM to wave propagation problems”, *Riv. Mat. Univ. Parma*, **2**, 147-187, (2011)
- [28AR] **A.Aimi, M.Diligenti, C.Guardasoni:** “On the energetic Galerkin boundary element method applied to interior wave propagation problems”, *J. Comp. Appl. Math.*, **235**, 1746–1754, (2011)
- [27AR] **A.Aimi, M.Diligenti, S.Panizzi:** “Energetic Galerkin BEM for wave propagation Neumann exterior problems”, *CMES*, **58**, 185–219, (2010)
- [26AR] **A.Aimi, M.Diligenti, C.Guardasoni:** “Numerical integration schemes for space-time hypersingular integrals in energetic Galerkin BEM”, *Numer. Algorithms*, **55**, 145–170, (2010)
- [25AR] **A.Aimi, M.Diligenti, I.Mazzieri, S.Panizzi, C.Guardasoni:** “A space-time Galerkin BEM for 2D exterior wave propagation problems”, in *Applied and Industrial Mathematics in Italy III*, Series on Advances in Mathematics for Applied Sciences, De Bernardis E., Spigler R., Valente V., (Eds.), Vol. 82, World Scientific, 13-24, (2010)
- [24AR] **A.Aimi, M.Diligenti, C.Guardasoni, I.Mazzieri, S.Panizzi:** “An energy approach to space-time Galerkin BEM for wave propagation problems”, *Internat. j. Numer. Methods Engrg.*, **80**, 1196–1240, (2009)
- [23AR] **A.Aimi, M.Diligenti:** “A new space-time energetic formulation for wave propagation analysis in layered media by BEMs”, *Internat. j. Numer. Methods Engrg.*, **75**, 1102-1132, (2008)
- [22AR] **A.Aimi, M.Diligenti, C.Guardasoni, S.Panizzi:** “A space-time energetic formulation for wave propagation analysis by BEMs”, *Riv. Mat. Univ. Parma*, (7) **8**, 171-207, (2008)

- [21AR] **A.Aimi, M.Diligenti:** “Numerical Integration Schemes for Petrov-Galerkin Infinite BEM”, *Appl. Numer. Math.*, **58**, 1084-1102, (2008)
- [20AR] **A.Aimi, M.Diligenti:** “Restriction Matrices for Numerically Exploiting Symmetry”, *Adv. Comput. Math.*, **28**, 201-235, (2008)
- [19AR] **A.Aimi, M.Diligenti, M.Groppi, C.Guardasoni:** “On the numerical solution of a BGK-type model for chemical reactions”, *European J. Mech. –B/Fluids* , **26**, 455-472, (2007)
- [18AR] **A.Aimi, M.Diligenti:** “Numerical Integration Schemes for hypersingular integrals on the real line”, *Communications to SIMAI Congress*, **2**, 1-10, (2007)
- [17AR] **A.Aimi, M.Diligenti, M.Groppi, C.Guardasoni:** “Numerical approximation of a BGK-type relaxation model for reactive mixtures”, in *Applied and Industrial Mathematics in Italy II*, Series on Advances in Mathematics for Applied Sciences, Cutello V., Fotia G., Puccio L.(Eds.), Vol. 75, World Scientific, Singapore, 1-12, (2007)
- [16AR] **A.Aimi, M.Diligenti, F.Freddi:** “Numerical aspects in the SGBEM solution of softening cohesive interface problems”, *J. Comp. Appl. Math.* , **210**, 22-33, (2007)
- [15AR] **A.Aimi, M.Diligenti, A.Salvadori:** “Restriction Matrices and Symmetric Panel Clustering Method for multi-domain SGBEM”, in M.Primicerio, R.Spigler, V.Valente (Eds.): *Applied and Industrial Mathematics in Italy*, Series on Advances in Mathematics for Applied Sciences, Vol. 69, World Scientific, London, 1-12, (2005)
- [14AR] **A.Aimi, M.Diligenti, F.Lunardini:** “Panel Clustering Method and Restriction Matrices for Symmetric Galerkin BEM”, *Numer. Algorithms*, **40**, 355-382, (2005)
- [13AR] **A.Aimi, M.Diligenti, F.Freddi, A.Salvadori:** “Restriction Matrices for SGBEM Applications”, *Comp. Mech.*, **32**, 430-444, (2003)
- [12AR] **A.Aimi, M.Diligenti, F.Lunardini, A.Salvadori:** “A New Application of the Panel Clustering Method for 3D SGBEM”, *CMES: Computer Modeling in Engineering & Sciences*, **4**, 1, 31-49, (2003)
- [11AR] **A.Aimi, L.Bassotti, M.Diligenti:** “Groups of Congruences and Restriction Matrices”, *BIT Numerical Mathematics*, **43**, 671-693, (2003)
- [10AR] **A.Aimi, M.Diligenti:** “Numerical integration in 3D Galerkin BEM solution of HBIEs”, *Comp. Mech.*, **28**, 233-249, (2002)
- [9AR] **A.Aimi, M.Diligenti:** “Hypersingular kernel integration in 3D Galerkin boundary element method”, *J. Comp. Appl. Math.*, **138**, 1, 51-72, (2002)
- [8AR] **A.Aimi, L.Bassotti, M.Diligenti:** “Analisi di algoritmi per la risoluzione in parallelo di problemi al contorno di tipo ellittico”, *Riv. Mat. Univ. Parma*, (6) **3** , 219-244 , (2000)
- [7AR] **A.Aimi, M.Diligenti, G.Monegato:** “Numerical integration schemes for the BEM solution of hypersingular integral equations”, *Internat. j. Numer. Methods Engrg.*, **45**, 1807-1830, (1999)

[6AR] **A.Aimi:** “New numerical integration schemes for the solution of (hyper)singular integral equations with Galerkin BEM”, *Bollettino U.M.I.*, (8) 2-A Suppl., 177-179, (1999)

[5AR] **A.Aimi, A.Carini, M.Diligenti, G.Monegato:** “Numerical integration schemes for evaluation of (hyper)singular integrals in 2D BEM”, *Comp. Mech.*, **22** (1), 1-11, (1998)

[4AR] **A.Aimi, M.Diligenti:** “Error analysis for singular integral evaluation on piecewise smooth curves in Galerkin BEM”, *Riv. Mat. Univ. Parma*, (6) **1**, 181-205, (1998)

[3AR] **A.Aimi, M.Diligenti, G.Monegato:** “New numerical integration schemes for applications of Galerkin BEM to 2D problems”, *Internat. j. Numer. Methods Engrg.*, **40**, 1977-1999, (1997)

[2AR] **A.Aimi, M.Diligenti:** “Stima dell’errore nel calcolo degli autovettori nel problema del Buckling di una piastra incastrata al bordo”, *Calcolo*, **30** (2), 171-187, (1993)

[1AR] **A.Aimi, M.Diligenti:** “Difetti ed eccessi degli autovalori del classico problema di Buckling”, *Calcolo*, **29** (3-4), 313-328, (1992)

Research papers or abstracts in Conference Proceedings:

[48AC] **A.Aimi, M.Diligenti, M.L.Sampoli, A.Sestini:** “Isogeometric Analysis and Symmetric Galerkin BEM: a 2D numerical study“, *SMART 2014 Abstracts*, p. 26, (2014)

[47AC] **A.Aimi, M.Diligenti, C.Guardasoni, S.Panizzi:** “Energetic BEM-FEM coupling for the numerical solution of the damped wave equation“, *ICNAAM 2014 - AIP Conference Proceedings*, Vol. ? (?), ??-??, (2014)

[46AC] **A.Aimi, M.Diligenti, C.Guardasoni, S.Panizzi:** “Numerical analysis of the damped wave equation by “energetic” formulations“, *WCCM XI Proceedings*, 3815-3826, (2014)

[45AC] **A.Aimi, L.Desiderio, M.Diligenti, C.Guardasoni:** “Analysis of Damped Waves Using Energetic BEM-FEM coupling“, *BETEQ 2014 Proceedings*, 28-33, (2014)

[44AC] **A.Aimi, L.Desiderio, M.Diligenti, C.Guardasoni:** “Energetic BEM-FEM for 2D wave propagation problems“, *Book of Abstracts, IWATA 2013*, 27, (2013)

[43AC] **A.Aimi, L.Desiderio, M.Diligenti, A.Frangi, C.Guardasoni:** “Energetic BEM-FEM coupling for wave propagation in layered media“, *BETEQ 2013 Proceedings*, 21-26, (2013)

[42AC] **A.Aimi, M.Diligenti, A.Frangi, C.Guardasoni:** “Energetic BEM-FEM coupling for wave propagation in unbounded domains“, *Proceedings of the 11th International Conference on Mathematical and Numerical Aspects of Waves (Waves 2013)*, 185-186, 2013

[41AC] **A.Aimi, C.Guardasoni, S.Panizzi:** “BEM-FEM coupling for the one-dimensional Klein-Gordon equation“, *Proceedings of the 11th International Conference on Mathematical and Numerical Aspects of Waves (Waves 2013)*, 193-194, 2013

[40AC] **A.Aimi, M.Diligenti, C.Guardasoni:** “Platonic Solids, Restrictions Matrices and Space-Time Energetic Galerkin BEM“, *Proceedings of the 11th International Conference on Mathematical and Numerical Aspects of Waves (Waves 2013)*, 199-200, 2013

- [39AC] **A.Aimi, M.Diligenti, A.Frangi, C.Guardasoni:** “Restriction matrices for exploiting symmetry in 3D wave propagation analysis by Energetic BEM”, *CD-ROM Proceedings of the 6th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2012)*, 1-20, (2012)
- [38AC] **A.Aimi, M.Diligenti, A.Frangi, C.Guardasoni:** “A stable energetic Galerkin BEM for 3D wave propagation interior problems”, *Abstracts, XI Congresso SIMAI*, 126, (2012)
- [37AC] **A.Aimi, M.Diligenti, C.Guardasoni, S.Panizzi:** “An energetic approach to BEM-FEM coupling for wave propagation phenomena”, *Abstracts, XI Congresso SIMAI*, 124, (2012)
- [36AC] **A.Aimi, M.Diligenti, C.Guardasoni, S.Panizzi:** “On the regularization of Galerkin BEM hypersingular bilinear forms”, *Book of Abstracts, SC2011*, 226, (2011)
- [35AC] **A.Aimi, C.Guardasoni, S.Panizzi, A.Frangi:** “Un metodo BEM energetico di tipo Galerkin per problemi di propagazione di onde“, *Conferenze e Comunicazioni XIX Congresso UMI*, 265, (2011)
- [34AC] **A.Aimi, M.Diligenti, A.Frangi, C.Guardasoni:** “On the energetic Galerkin BEM applied to 3D wave propagation problems“, *Extended Abstracts IABEM 2011*, 6pp., (2011)
- [33AC] **A.Aimi, A.Carini, M.Diligenti, A.Salvadori:** “Variational formulations for the energetic approach to 2D wave propagation boundary integral equations“, *Extended Abstracts IABEM 2011*, 6pp., (2011)
- [32AC] **A.Aimi, M.Diligenti, C.Guardasoni:** “Energetic Galerkin BEM for 2D Wave Propagation Problems in Piecewise Homogeneous Media“, *ICNAAM 2010 - AIP Conference Proceedings*, Vol. 1281 (III), 2085-2088, (2010)
- [31AC] **A.Aimi, M.Diligenti, C.Guardasoni:** “Multi-domain BEM for two dimensional problems of wave propagation“, *Book of Abstracts X SIMAI Congress*, 71, (2010)
- [30AC] **A.Aimi, M.Diligenti, C.Guardasoni:** “Exploiting geometrical symmetries in space-time BIEs discretization”, *Abstracts ECCM 2010*, 1p., (2010)
- [29AC] **A.Aimi, M.Diligenti, C.Guardasoni:** “Efficient numerical integration schemes for the discretization of hypersingular BIEs related to wave propagation problems”, *Book of Abstracts DWCAA09*, 64, (2009)
- [28AC] **A.Aimi, M.Diligenti, C.Guardasoni:** “Numerical integration schemes for the discretization of BIEs related to wave propagation problems”, *Proceedings of IX CMMSE Conference*, J.Vigo-Aguiar (Ed.), Volumen I, 45-56, (2009)
- [27AC] **A.Aimi, M.Diligenti, C.Guardasoni, I.Mazzieri, S.Panizzi:** “An energy approach for time-domain boundary integral formulations of the wave equation”, *Book of Abstracts IX SIMAI Congress*, 1 p., (2008)
- [26AC] **A.Aimi, C.Guardasoni, S.Panizzi:** “One-dimensional wave propagation analysis in layered media by BEMs”, *Book of Abstract of the SIMAI Meeting on “Perspective on Development of the Applied Mathematics in Italy*, 1p., (2007)

- [25AC] **A.Aimi, M.Diligenti, C.Guardasoni:** “Numerical results for the wave propagation problem with space-time boundary element method”, *Atti XVIII Congresso AIMETA*, , CD-rom, 12 pp., (2007)
- [24AC] **A.Aimi, A.Carini, M.Diligenti, S.Panizzi, A.Salvadori:** “Space-time variational formulations for BIEs related to the wave problem”, *Atti XVIII Congresso AIMETA*, CD-rom, 11 pp., (2007)
- [23AC] **A.Aimi, A.Carini, M.Diligenti, C.Guardasoni:** “Numerical results of one-dimensional wave propagation analysis in layered media”, *BETEQ 2007 Proceedings*, 6 pp., (2007)
- [22AC] **A.Aimi, S.Panizzi, A.Carini, M.Diligenti:** “Remarks on space-time variational formulations for BIEs related to the wave problem”, *BETEQ 2007 Proceedings*, 6 pp., (2007)
- [21AC] **A.Aimi, M.Diligenti:** “Numerical Integration Schemes for Petrov-Galerkin Infinite BEM”, *Book of Abstracts, IABEM 2006 Conference*, 297-300, (2006)
- [20AC] **A.Aimi, M.Diligenti, M.Groppi, C.Guardasoni:** “Numerical approximation of a BGK-type relaxation model for reactive mixtures”, *Extended Abstracts VIII Congresso SIMAI*, CD Rom, 4 pp., (2006)
- [19AC] **A.Aimi, M.Diligenti:** “Numerical Integration Schemes for hypersingular integrals on the real line”, *Extended Abstracts VIII Congresso SIMAI*, CD Rom, 4 pp., (2006)
- [18AC] **A.Aimi, A.Carini, M.Diligenti, A.Feriani, A.Salvadori:** “BEM simulations over unbounded domains”, *Atti XVII Congresso Nazionale AIMETA*, CD-rom, 10 pp., (2005)
- [17AC] **A.Aimi, M.Diligenti, F.Freddi:** “Softening cohesive interface problems: solution via Boundary Element Method”, *Poster, NAC 2005*, (2005)
- [16AC] **A.Aimi, M.Diligenti, A.Salvadori:** “Restriction Matrices and Panel Clustering Method for multi-domain SGBEM”, *Sommari VII Congresso SIMAI*, 1 p., (2004)
- [15AC] **A.Aimi, M.Diligenti, F.Freddi, F.Lunardini:** “Restriction Matrices and Domain Decomposition Method for SGBEM Applications”, *Atti XVI Congresso Nazionale AIMETA*, 1 p., (2003)
- [14AC] **A.Aimi, M.Diligenti:** “Groups Representation Theory and Restriction Matrices”, *Abstracts of Talks , ICCAM X*, 1 p., (2002)
- [13AC] **A.Aimi, M.Diligenti, F.Freddi, A.Salvadori:** “Restriction Matrices for SGBEM Application”, *Extended Abstracts IABEM 2002*, 12 pp., (2002)
- [12AC] **A.Aimi, M.Diligenti, F.Lunardini, A.Salvadori:** “Use of panel clustering method in numerical-analytical schemes for 3D SGBEM”, *Sommari VI Congresso Nazionale SIMAI*, 1 p., (2002)
- [11AC] **A.Aimi, M.Diligenti:** “Geometrical Symmetry in Symmetric Galerkin BEM”, in J.Levesley, I.Anderson, J.C.Mason (eds.): *Algorithms for Approximation IV*, The University of Huddersfield, 78-85, (2002)

[10AC] **A.Aimi, M.Diligenti, F.Lunardini, A.Salvadori:** "A panel clustering algorithm for 3D SGBEM with analytical inner integrations in elasticity", *Atti XV Congresso Nazionale AIMETA*, 2 pp., (2001)

[9AC] **A.Aimi, M.Diligenti:** "Geometrical symmetry and restriction matrices", *Atti XV Congresso Nazionale AIMETA*, CD-rom, 10 pp., (2001)

[8AC] **A.Aimi, M.Diligenti:** "Geometrical Symmetry in Symmetric Galerkin BEM ", *Proceedings of ALGORITHMS FOR APPROXIMATION IV*, University of Huddersfield, 19-20, (2001)

[7AC] **A.Aimi, M.Diligenti:** "Numerical integration in 3D Galerkin BEM solution of HBIEs", *Extended Abstracts IABEM 2000*, 5-8, (2000)

[6AC] **A.Aimi, M.Diligenti:** "Hypersingular kernel integration in 3D Galerkin boundary element method", *Sommari V Congresso Nazionale SIMAI*, 679-682, (2000)

[5AC] **A.Aimi:** "Nuovi schemi di integrazione numerica per la risoluzione di equazioni integrali (iper)singolari con il metodo di Galerkin agli elementi di contorno", *Sommari Convegno Nazionale di Analisi Numerica*, 11-12, (1998)

[4AC] **A.Aimi, A.Carini, M.Diligenti, A.Salvadori:** "Some results on analytical and numerical integration in 3D Galerkin BEM solution of HBIEs", *Proceedings of the IABEM International Symposium on Boundary Elements Methods*, 57-58, (1998)

[3AC] **A.Aimi, A.Carini, M.Diligenti:** "Numerical integration schemes for evaluation of (hyper)singular integrals in 2D BEM", in F.G.Benitez (ed.): *IABEM Workshop-Fundamental solutions in Boundary Elements: formulation and integration*, 185-204, (1997)

[2AC] **A.Aimi, A.Carini, M.Diligenti:** "Applications of the h-p version of symmetric boundary element method", *Atti XII Congresso Nazionale AIMETA, Meccanica delle Strutture, Tomo 1*, 25-30, (1995)

[1AC] **A.Aimi, G. Di Cola, M.Diligenti:** "Analisi di due algoritmi per la risoluzione in parallelo di problemi ellittici al contorno", *Sommari II Congresso Nazionale SIMAI*, 346-348, (1994)

#### Technical Reports:

[16RT] **A.Aimi, S.Panizzi:** "On the regularization of bilinear forms with hypersingular kernel", *Quaderni Dip. Mat. Univ. Parma*, n.506, 1-32, (2012)

[15RT] **A.Aimi, M.Diligenti, M.Manzini:** "Efficient generation of restriction matrices for exploiting partial or complete symmetries in 2D and 3D problems", *Quaderni Dip. Mat. Univ. Parma*, n.504, 1-30, (2011)

[14RT] **A.Aimi, M.Diligenti, C.Guardasoni:** "Numerical integration schemes for the Galerkin BEM related to wave propagation problems", *Quaderni Dip. Mat. Univ. Parma*, n.495, 1-34, (2009)

- [13RT] **A.Aimi, M.Diligenti, C.Guardasoni, I.Mazzieri, S.Panizzi:** “An energy approach to space-time Galerkin BEM for wave propagation problems”, *Quaderni Dip. Mat. Univ. Parma*, n.487, 1-34, (2008)
- [12RT] **A.Aimi, M.Diligenti, S.Panizzi:** “Weak and variational formulations for BIEs related to the wave equation”, *Quaderni Dip. Mat. Univ. Parma*, n.464, 1-19, (2007)
- [11RT] **A.Aimi, M.Diligenti:** “One-dimensional wave propagation analysis in layered media by BEMs”, *Quaderni Dip. Mat. Univ. Parma*, n.462, 1-22, (2007)
- [10RT] **A.Aimi, M.Diligenti:** “Numerical integration schemes for hypersingular integrals on the real line”, *Quaderni Dip. Mat. Univ. Parma*, n.439, 1-14, (2006)
- [9RT] **A.Aimi, M.Anelli, M.Diligenti:** “ Formulazione del metodo di Galerkin simmetrico per equazioni integrali di contorno per problemi con interfaccia”, *Quaderni Dip. Mat. Univ. Parma*, n.416, 1-21, (2005)
- [8RT] **A.Aimi, M.Diligenti, F.Lunardini:** “A symmetry adapted panel clustering technique for SGBEM”, *Quaderni Dip. Mat. Univ. Parma*, n.331, 1-27, (2003)
- [7RT] **A.Aimi, F.Lunardini:** “Coupling panel clustering with inner analytical integrations in Galerkin BEM”, *Quaderni Dip. Mat. Univ. Parma*, n.275, 1-15, (2002)
- [6RT] **A.Aimi, L.Bassotti, M.Diligenti:** “Gruppi di congruenze e matrici di restrizione”, *Quaderni Dip. Mat. Univ. Parma*, n.261, 1-20, (2001)
- [5RT] **A.Aimi, L.Bassotti, M.Diligenti:** “Un metodo di decomposizione per sistemi finiti di funzioni invarianti rispetto ad un gruppo di congruenze”, *Quaderni Dip. Mat. Univ. Parma*, n.247, 1-18, (2000)
- [4RT] **A.Aimi, M.Diligenti:** “Integral evaluation of (hyper)singular Galerkin type boundary element integrals for 3D problems”, *Quaderni Dip. Mat. Univ. Parma*, n.219, 1-30, (2000)
- [3RT] **A.Aimi:** “Costruzione di sottospazi dello spazio di elementi finiti triangolari su poligoni regolari”, *Quaderni Dip. Mat. Univ. Parma*, n.136, 1-11, (1996)
- [2RT] **G.Lupatini, A.Aimi:** “Un algoritmo parallelo per la generazione di quadtree relativi a figure piane”, *Atti Dip. Ing. Meccanica Univ. Brescia*, n.39, 1-21, (1994)
- [1RT] **A.Aimi:** “Alcune applicazioni del sistema Express nella programmazione parallela su transputers”, *Atti Dip. Ing. Meccanica Univ. Brescia*, n.31, 1-52, (1993)

Curatele:

- [2C] **A.Aimi, M.Diligenti:** Atti del Convegno “Integral Equations: recent numerical developments and new applications”, Dip. Mat., Univ. Parma, 29-30 Ottobre 2009, *Riv. Mat. Univ. Parma*, **2**, (2011)

[1C] **A.Aimi, M.Diligenti:** Atti del Convegno “Equazioni Integrali: recenti sviluppi numerici e nuove applicazioni”, Dip. Mat., Univ. Parma, 27-28 Settembre 2007, *Riv. Mat. Univ. Parma*, (7) **8**, (2008)

Thesis:

[2T] **A.Aimi:** “New numerical integration schemes for the solution of (hyper)singular integral equations with Galerkin BEM”, PhD Thesis, Univ. Milano, (1998)

[1T] **A.Aimi:** “Un’applicazione del metodo degli invarianti ortogonali all’operatore dell’elasticità in un rettangolo”, Degree Thesis, Univ. Parma, (1990)

## TEACHING ACTIVITY

- **a.a. 2014/15:**
  - **course** of *Numerical Models and Methods* (9 CFU), C.L.M. in Mathematics, Univ. Parma
  - **course** of *Basic Mathematics applied to the biomedical Sciences* (5 CFU), C.L.T. in Zootechnical Sciences and technics of animals productions, Univ. Parma
- **a.a. 2013/14:**
  - **course** of *Numerical Models and Methods* (9 CFU), C.L.M. in Mathematics, Univ. Parma
  - **exercise course** of *Numerical Analysis*, C.L.T. in Mathematics and C.L.T. in Computer Science, Univ. Parma
- **a.a. 2012/13:**
  - **course** of *Numerical Models and Methods* (9 CFU), C.L.M. in Mathematics, Univ. Parma
  - **exercise course** of *Numerical Analysis*, C.L.T. in Mathematics and C.L.T. in Computer Science, Univ. Parma
- **a.a. 2011/12:**
  - **course** of *Numerical Models and Methods* (9 CFU), C.L.M. in Mathematics, Univ. Parma
  - **course** of *Numerical Methods for Integral Equations* (3 CFU), PhD Course in Pure and Applied Mathematics, Univ. Parma
  - **exercise course** of *Numerical Analysis*, C.L.T. in Mathematics and C.L.T. in Computer Science, Univ. Parma
  - **exercise course** of *Approximation Methods*, C.L.M. in Mathematics, Univ. Parma
- **a.a. 2010/11:**
  - **exercise course** of *Numerical Analysis*, C.L.T. in Mathematics and C.L.T. in Computer Science, Univ. Parma
  - **exercise course** of *Numerical Mathematics*, C.L.M. in Mathematics, Univ. Parma
  - **exercise course** of *Approximation Methods*, C.L.M. in Mathematics, Univ. Parma
- **a.a. 2009/10:**
  - **course** of *Numerical Mathematics* (9 CFU), C.L.M. in Mathematics, Univ. Parma
  - **course** of *Numerical Methods for Integral Equations* (6 CFU), C.L.M. in Mathematics, Univ. Parma
  - **course** of *Numerical Analysis Lab* (3 CFU), C.L.T. in Computer Science, Univ. Parma



- **exercise course** of *Numerical Analysis 1*, C.L.T. in Mathematics, Univ. Parma
- **a.a. 2008/09:**
  - **course** of *Approximation Methods (6 CFU)*, C.L.S. in Pure and Applied Mathematics, Univ. Parma
  - **course** of *Numerical Methods for Integral Equations (6 CFU)*, C.L.S. in Pure and Applied Mathematics, Univ. Parma
  - **course** of *Numerical Analysis Lab (3 CFU)*, C.L. in Computer Science, Univ. Parma
  - **exercise course** of *Numerical Analysis 1*, C.L. in Mathematics, Univ. Parma
- **a.a. 2007/08:**
  - **course** of *Numerical Analysis 2 (6 CFU)*, C.L. in Mathematics, Univ. Parma
  - **course** of *Approximation Methods (6 CFU)*, C.L.S. in Pure and Applied Mathematics, Univ. Parma
  - **course** of *Numerical Methods for Integral Equations (6 CFU)*, C.L.S. in Pure and Applied Mathematics, Univ. Parma
  - **course** of *Numerical Analysis A (5 CFU)*, C.L.S. in Environmental Engineering, Univ. Parma
  - **course** of *Numerical Analysis Lab (3 CFU)*, C.L. in Computer Science, Univ. Parma
  - **exercise course** of *Numerical Analysis 1*, C.L. in Mathematics, Univ. Parma
- **a.a. 2006/07:**
  - **course** of *Approximation Methods (6 CFU)*, C.L.S. in Pure and Applied Mathematics, Univ. Parma
  - **course** of *Numerical Methods for Integral Equations (6 CFU)*, C.L.S. in Pure and Applied Mathematics, Univ. Parma
  - **course** of *Elements of Numerical Analysis (5 CFU)*, C.L.S. in TLC Engineering, Univ. Parma
  - **exercise course** of *Numerical Analysis 1*, C.L. in Mathematics, Univ. Parma
  - **exercise course** of *Numerical Analysis Lab*, C.L. in Mathematics, Univ. Parma
- **a.a. 2005/06:**
  - **course** of *Approximation Methods (6 CFU)*, C.L.S. in Pure and Applied Mathematics, Univ. Parma
  - **course** of *Elements of Numerical Analysis (5 CFU)*, C.L.S. in TLC Engineering, Univ. Parma
  - **exercise course** of *Numerical Analysis 1*, C.L. in Mathematics, Univ. Parma
  - **exercise course** of *Numerical Analysis 2*, C.L. in Mathematics, Univ. Parma
- **a.a. 2004/05:**
  - **course** of *Numerical Analysis 2 (6 CFU)*, C.L. in Mathematics, Univ. Parma
  - **course** of *Elements of Numerical Analysis (5 CFU)*, C.L.S. in TLC Engineering, Univ. Parma
  - **exercise course** of *Numerical Analysis 1*, C.L. in Mathematics, Univ. Parma
- **a.a. 2003/04:**
  - **course** of *Numerical Analysis 1 (6 CFU)*, C.L. in Mathematics, C.L. in Computer Science, Univ. Parma
  - **course** of *Numerical Analysis Lab (3 CFU)*, C.L. in Mathematics, C.L. in Computer Science, Univ. Parma
- **a.a. 2002/03:**
  - **course** of *Numerical Analysis 2 (6 CFU)*, C.L. in Mathematics, Univ. Parma
  - **course** of *Numerical Analysis Lab (3 CFU)*, C.L. in Mathematics, Univ. Parma

- **exercise course** of *Numerical Analysis I*, C.L. in Mathematics, Univ. Parma
- **a.a. 2001/02:**
  - **course** of *Numerical Analysis II*, C.L. in Mathematics, Univ. Parma
  - **course** of *Numerical Analysis Lab*, C.L. in Mathematics, Univ. Parma
  - **exercise course** of *Numerical Analysis I*, C.L. in Mathematics, Univ. Parma
  - **exercise course** of *Approximation Methods*, C.L. in Mathematics, Univ. Parma
- **a.a. 2000/01:**
  - **course** of *Approximation Methods*, C.L. in Mathematics, Univ. Parma
  - **exercise and lab course** of *Numerical Analysis*, C.L. in Mathematics, Univ. Parma
- **a.a. 1999/00:**
  - **exercise and lab course** of *Numerical Analysis*, C.L. in Mathematics, Univ. Parma
- **a.a. 1998/99:**
  - **exercise and lab course** of *Numerical Analysis*, C.L. in Mathematics, Univ. Parma
  - **exercise course** of *Approximation Methods*, C.L. in Mathematics, Univ. Parma
- **a.a. 1997/98:**
  - **exercise and lab course** of *Numerical Analysis*, C.L. in Mathematics, Univ. Parma
  - **exercise course** of *Approximation Methods*, C.L. in Mathematics, Univ. Parma
- **a.a. 1994/95:**
  - **course** of *Numerical Analysis and Numerical Programming*, D.U. in Civil Engineering, Univ. Parma
  - **exercise course** of *Numerical Analysis*, C.L. in Mechanical Engineering, Univ. Brescia
  - **exercise course** of *Mathematical Analysis I*, D.U. in Methods in Physics, Univ. Parma
- **a.a. 1993/94:**
  - **course** of *Numerical Analysis and Numerical Programming*, D.U. in Civil Engineering, Univ. Parma
  - **exercise course** of *Numerical Analysis*, C.L. in Mechanical Engineering, Univ. Brescia
  - **exercise course** of *Numerical Analysis*, D.U. in Computer Science Engineering, Univ. Parma
- **a.a. 1992/93:**
  - **course** of *Numerical Analysis and Numerical Programming*, D.U. in Civil Engineering, Univ. Parma
  - **exercise course** of *Numerical Analysis*, C.L. in Mechanical Engineering, Univ. Brescia
- **a.a. 1991/92:**
  - **exercise course** of *Numerical Analysis*, C.L. in Mechanical Engineering, Univ. Brescia

Further:

- **Supervisor of 8 Degree Thesis** in Numerical Analysis at the University of Parma
- **Co-supervisor of 8 Degree Thesis** in Numerical Analysis at the University of Parma and at the University of Brescia.

## ORGANIZING ACTIVITIES

- **June 25<sup>th</sup> -28<sup>th</sup>, 2012:** Responsible for the Organizing Committee of the Minisymposium: “Integral Equations: numerical methods and applications”, XI SIMAI Congress, Torino.
- **January 31<sup>st</sup> 2011:** Responsible for the Organizing Committee of the scientific day concluding Project INdAM-GNCS 2011 “Tecniche numeriche per problemi di propagazione di onde elastiche in multidomini”, Parma University.
- **October 29<sup>th</sup> -30<sup>th</sup>, 2009:** Responsible for the Organizing Committee of the Workshop “Integral Equations: recent numerical developments and new applications”, Parma University
- **September 27<sup>th</sup> -28<sup>th</sup>, 2007:** Member of the Organizing Committee of the Workshop “Equazioni Integrali: recenti sviluppi numerici e nuove applicazioni”, Parma University
- **May 22<sup>nd</sup> -26<sup>th</sup>, 2006:** Member of the Organizing Committee of the Minisymposium: “Boundary integral equations: recent numerical developments and applications”, VIII SIMAI Congress
- **December 6<sup>th</sup>, 2002:** Member of the Organizing Committee of the Scientific Day in honour of Prof. Lucilla Bassotti Rizza, Parma University
- **July 4<sup>th</sup> -7<sup>th</sup>, 2000:** Member of the Organizing Committee of IABEM 2000: Symposium of the International Association for Boundary Element Methods, Brescia University

## OTHER ACTIVITIES

- **From 2014 to 2016:** Secretary of the Scientific Committee of Area 101 of Parma University, for the evaluation of Mathematics and Computer Science Department Research
- **From 2011:** Member of the Scientific Committee of the PhD School in Science and Technology of Parma University
- **From 2008 to 2010:** Secretary of the Scientific Committee of Area 101 of Parma University, for the evaluation of Mathematics Department Research
  
- **Since 2013:** Member of the Teachers of the PhD Course in Mathematics of Ferrara, Modena e Reggio Emilia, Parma University Consortium
- **From 2011 to 2013:** Member of the Teachers of the PhD Course in Pure and Applied Mathematics of Parma University
- **Since 2010:** Member of the Teaching Committee for the degree courses in Mathematics
- **Since 2014:** Responsible for the Quality Assurance of the degree courses in Mathematics
- **Since 2013:** Member of the Group for the Self-Evaluation of Teaching Activities for the degree courses in Mathematics
  
- **Since 2006:** Member of the Library Scientific Committee of Mathematics Department
- **From 2002 to 2005:** Member of Mathematics Department Advisory Committee
  
- **February-April 2008:** Member of the Judging Committee in a Competitive Examination for an Assistant Professor position in Numerical Analysis at Milano Polytechnic.

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