CURRICULUM VITAE

Alberto Carpinteri
Born in Bologna-Italy on December 23, 1952
http://staff.polito.it/alberto.carpinteri

EDUCATION

Doctoral Degree in Nuclear Engineering cum Laude, University of Bologna, Bologna-Italy, 1976
Doctoral Degree in Mathematics cum Laude, University of Bologna, Bologna-Italy, 1981

CURRENT POSITIONS

Professor and Chair of Solid and Structural Mechanics, Politecnico di Torino, Torino-Italy, 1986-
Director – "Alberto Castigliano" Fracture Mechanics Laboratory, Politecnico di Torino, Torino-Italy, 1999-

PREVIOUS POSITIONS

Visiting Scientist, Lehigh University, Bethlehem-Pennsylvania, USA, 1982-1983
Visiting Professor, University of São Paulo, São Paulo-Brazil, July-August 2010
Assistant Professor of Solid and Structural Mechanics, University of Bologna, Bologna-Italy, 1980-1986
Researcher, Nuclear Power Plants Programme, Consiglio Nazionale delle Ricerche, Bologna-Italy, 1978-1980
Engineer, Technical Office, Breda Fucine, Milano-Italy, 1977

INSTITUTIONAL RESPONSIBILITIES

President of the National Research Institute of Metrology (INRIM), Torino-Italy, 2011-2013
Member and Vice-president of the Board of Directors, National Research Institute of Metrology (INRIM), Torino-Italy, 2006-2011; Acting President, July-November 2009
Head of the Department of Structural Engineering, Politecnico di Torino, Torino-Italy, 1989-1995
Founding Director – Post-graduate School of Structural Engineering, Politecnico di Torino, Torino-Italy, 1990-2014
President, International Congress on Fracture (ICF), 2009-2013
President, European Structural Integrity Society (ESIS), 2002-2006
President, International Association of Fracture Mechanics for Concrete and Concrete Structures (IA-FraMCoS), 2004-2007
President, Italian Group of Fracture (IGF), 1998-2005
Member of the Congress Committee, International Union of Theoretical and Applied Mechanics (IUTAM), 2004-2012
Member of the Executive Board, Society for Experimental Mechanics (SEM), 2012-2014

COMMISSIONS OF TRUST

Nominator of the Global Energy Prize, 2015
International Reviewer of the Russian Science Foundation (RSF), 2015-
Editor-in-Chief of the International Journal "Meccanica" (Springer, IF=1.949, in three years the issues per year were brought from 6 to 12), 2012-2014
Member of the Editorial Board of thirteen international journals, among which:
"Theoretical and Applied Fracture Mechanics", 1984-2013
"Numerical and Analytical Methods in Geomechanics", 1995-2013
"Strength, Fracture and Complexity", 2003-
"Engineering Fracture Mechanics", 2005-
"Physical Mesomechanics", 2005-
"International Journal of Fracture", 2006-2013
"Strain – An International Journal for Experimental Mechanics", 2009- 2015
Member of the Expert Panel for the Research Evaluation of the Department of Civil Engineering at the Technical University of Denmark, Lyngby-Denmark, 2007
Member of the Evaluation Committee for the attainment of the position of Full Professor at the following Universities: (1) Israel Institute of Technology (Technion), Haifa-Israel, 2011; (2) Indian Institute of Science, Bangalore-India, 2011; (3) University of Athens, Athens-Greece, 2012

FELLOWSHIPS

Fellow of the European Academy of Sciences, Bruxelles-Belgium, 2009-
Fellow of the European Academy of Sciences and Arts, Salzburg-Austria, 2012-
Fellow of the Academia Europea, London-UK, 2013-
Fellow of the International Academy of Engineering, Moscow-Russia, 2010-
Fellow of the Turin Academy of Sciences (founded by G.L. Lagrange in 1783), Torino-Italy, 2005-; Member, 1995-2005
Member of the Istituto Lombardo – Accademia di Scienze e Lettere (founded by A. Volta in 1804), Milano-Italy, 2006-
Member of the Bologna Academy of Sciences, Bologna-Italy, 2011-
Member of the Accademia Teatina per le Scienze, Chieti-Italy, 2006-
Fellow of the American Society of Civil Engineers (ASCE), Reston-Virginia, USA, 1995-; Member, 1985-1995
Honorary Fellow of the International Congress on Fracture (ICF), Ottawa-Canada, 2009-
Fellow of the European Structural Integrity Society (ESIS), Brno-Czech Republic, 2008-
Fellow of the International Association on Fracture Mechanics for Concrete and Concrete Structures (IA-FraMCoS), Jeju-Korea, 2010-

AWARDS

Odone Belluzzi Prize for Structural Mechanics, University of Bologna, Bologna-Italy, 1976
Robert l'Hermite Medal, International Union of Laboratories for Materials and Structures (RILEM), Paris-France, 1982
Wessex Institute of Technology Eminent Scientist Award, WIT, Southampton-UK, 2000

Griffith Medal for Fracture Mechanics, European Structural Integrity Society (ESIS), Brno-Czech Republic, 2008
Jerold L. Swedlow Memorial Lecture Award, American Society for Testing and Materials (ASTM), Philadelphia-USA, 2011
Paul Paris Gold Medal, International Congress on Fracture (ICF), Beijing-China, 2013

SUPERVISION OF GRADUATE STUDENTS

Supervisor of 30 Ph.D. Students between 1990 and 2015. Presently, most of them are taking University positions in Italy or abroad: four Full Professors, four Associate Professors, seven Assistant Professors, eight Post-doctoral Fellows, three are currently Ph.D. Students, whereas the remaining four are managers in public or private enterprises

TEACHING ACTIVITIES

European Coordinator of the "Innovative Learning and Training On Fracture" (ILTOF) Project, in the framework of the European Union Leonardo da Vinci Programme for Education and Culture (Total financial support = Euro 480 000), 2006-2008
Courses taught at the Politecnico di Torino between 1986 and 2015:
Structural Mechanics (Electrical Engineering, 14 credits), 1986-87
Structural Mechanics (Mechanical Engineering, 14 credits), 1987-2001
Statics (Architecture, 8 credits), 1999-2000
Structural Mechanics (Civil Engineering, 10 credits), 2001-2002
Advanced Structural Mechanics (Civil Engineering, 10 credits), 2002-2010
Theory of Structures (Civil Engineering, 5 credits), 2004-2010
Fracture Mechanics (Civil Engineering, 5 credits), 2004-2010
Static and Dynamic Stability of Slender Structures (Civil Engineering, 6 credits), 2010-
Fracture and Plasticity (Civil Engineering, 8 credits), 2010-

ORGANISATION OF MAJOR SCIENTIFIC EVENTS

Organizer, International ESIS-RILEM-CEB Workshop on "Applications of Fracture Mechanics to Reinforced Concrete", Torino-Italy, 1990
Organizer and Chairman of the Scientific Committee, IUTAM Symposium on "Size-Scale Effects in the Failure Mechanisms of Materials and Structures", Torino-Italy, 1994
Organizer and Chairman of the Scientific Committee, 11th International Conference on Fracture (ICF11), Torino-Italy, 2005 (record in the ICF history: 1041 participants)
Organizer and Chairman of the Scientific Committee, 6th International Conference on Fracture Mechanics for Concrete and Concrete Structures (FraMCoS-6), Catania-Italy, 2007
Organizer and Chairman, Mini-Symposium on "Cohesive Zone Models of Fracture and Failure", 22nd International Congress of Theoretical and Applied Mechanics, Adelaide-Australia, 2008

SCIENTIFIC ACTIVITIES AND MAJOR ACHIEVEMENTS

Author of over 800 papers (450 in the last ten years), of which more than 350 (230 in the last ten years) published in Refereed International Journals, on the following topics: fracture mechanics, fatigue crack growth, thermo-elasticity, seismic structures, reinforced concrete, structural monitoring, contact mechanics, fragmentation and comminution, drilling and wear, multi-layered and functionally graded materials, nano-structured and hierarchical materials, acoustic, electromagnetic, and neutron emissions from fracture and earthquakes
h-Index (Scopus) = 41
Total Citations (Scopus) = 6268
Author or Editor of 52 volumes

Three single-authored books published by International Publishers:

A. Carpinteri: Mechanical Damage and Crack Growth in Concrete: Plastic Collapse to Brittle Fracture, Martinus Nijhoff Publishers, Dordrecht (1986), XIII + 234
A. Carpinteri: Structural Mechanics: A Unified Approach, Chapman & Hall, London (1997), XV + 761
A. Carpinteri: Structural Mechanics Fundamentals, CRC Press (Taylor & Francis), Boca Raton (2013), XIV + 498

RESEARH TOPICS AND CUTTING-EDGE RESULTS

Different specific topics have been considered, always giving them a personal and original contribution. In some cases such a contribution resulted to be also innovative, anticipating even by years the trends in cutting-edge research. Among these peculiar aspects, it is significant to recall the following ones:
(1) Application of Dimensional Analysis (Buckingham's Theorem for physical similitude and scale modelling) to the scaling competition between plastic collapse and brittle fracture, which are failure mechanisms governed by generalized forces with different physical dimensions
(2) Interpretation of brittle crack propagation and of stick-slip friction instability in the framework of Catastrophe Theory by René Thom
(3) Application of Fractional Calculus to field and boundary equations of an elastic body deformable only over a fractal sub-set
(4) Solution to the problem of propagation stability of cracks bridged by reinforcements and/or fibres based on rigorous conditions of equilibrium and compatibility
(5) More recent papers deal with fundamental aspects, like the size effects on the friction coefficient and the criticality of rock slopes, the nonlinear and chaotic dynamic behaviour iof cracked or damaged solids, the fatigue limit and threshold with the related scaling laws, the energy emissions from fracture phenomena

TEN REPRESENTATIVE PUBLICATIONS AS SENIOR AUTHOR (LAST TEN YEARS)

[1] Carpinteri, A., Pugno, N., "Are scaling laws on strength of solids related to mechanics or to geometry?", Nature Materials, 4, 421-423 (2005). Times cited without self-citations: 69
[2] Carpinteri, A., Lacidogna, G., Pugno, N., "Structural damage diagnosis and life-time assessment by acoustic emission monitoring", Engineering Fracture Mechanics, 74, 273-289 (2007). Times cited without self-citations: 44

[3] Carpinteri, A., Cornetti, P., Pugno, N., Sapora, A., Taylor, D., "A finite fracture mechanics approach to structures with sharp V-notches", Engineering Fracture Mechanics, 75, 1736-1752 (2008). Times cited without self-citations: 42
[4] Carpinteri, A., Invernizzi, S., Lacidogna, G., "In situ damage assessment and nonlinear modelling of a historical masonry tower", Engineering Structures, 27, 387-395 (2005). Times cited without self-citations: 36
[5] Carpinteri, A., Cornetti, P., Pugno, N., "Edge debonding in FRP strengthened beams: Stress versus energy failure criteria", Engineering Structures, 31, 2436-2447 (2009). Times cited without self-citations: 25
[6] Carpinteri, A., Lacidogna, G., "Damage evaluation of three masonry towers by acoustic emission", Engineering Structures, 29, 1569-1579 (2007). Times cited without self-citations: 24
[7] Carpinteri, A., Lacidogna, G., Puzzi, S., "From criticality to final collapse: Evolution of the "b-value" from 1.5 to 1.0", Chaos Solitons & Fractals, 41, 843-853 (2009). Times cited without self-citations: 23
[8] Carpinteri, A., Sapora, A., "Diffusion problems in fractal media defined on Cantor sets", Zamm-Zeitschrift fur Angewandte Mathematik und Mechanik, 90, 203-210 (2010). Times cited without self-citations: 23
[9] Carpinteri, A., Paggi, M., Pugno, N., "Numerical evaluation of generalized stress-intensity factors in multi-layered composites", International Journal of Solids and Structures, 43, 627-641 (2006). Times cited without self-citations: 22
[10] Carpinteri, A., Chiaia, B., Invernizzi, S., "Numerical analysis of indentation fracture in quasi-brittle materials", Engineering Fracture Mechanics, 71, 567-577 (2004). Times cited without self-citations: 19

MAJOR INVITED PRESENTATIONS AT INTERNATIONAL CONFERENCES AND ADVANCED SCHOOLS (LAST TEN YEARS)

Several Invited Courses and Lectures at Conferences, Universities, and Research Institutions, in the following countries: Italy, Switzerland, Austria, France, Spain, Germany, The Netherlands, United Kingdom, Hungary, Poland, Greece, Denmark, Russia, Portugal, Finland, Sweden, Serbia, Turkey, Czech Republic, Belgium, USA, Mexico, South Africa, India, Japan, Australia, China, Malaysia, Canada, Brazil, Korea.

Major presentations in the last ten years:

Plenary Lecture on "Fracture mechanics and complexity sciences", 16th European Conference on Fracture, Alexandroupolis-Greece, 2006

Invited Lecture on "Asymptotic analysis in Elasticity: From the pioneering studies by Wieghardt until today", Karl Wiegaardt and George Irwin Centenary Conference on Structural Integrity in the Service of Public Safety, Vienna-Austria, 2007

Introductory Lecture for the two following courses, International Centre for Mechanical Sciences (CISM), Udine-Italy:

"Non-linear Fracture Mechanics Models", 2008, and "Fractals and Fractional Calculus in Continuum Mechanics", 1996

Introductory Lecture, Mini-Symposium on "Cohesive Zone Models of Fracture and Failure", 22nd International Congress of Theoretical and Applied Mechanics, Adelaide-Australia, 2008

Keynote Lecture on "The mitigation of stress-singularities in linear elasticity", 12th International Conference on Fracture, Ottawa-Canada, 2009

Opening Lecture on "Application of nonlinear fracture mechanics to the assessment of rotational capacity in reinforced concrete beams", 51° Congresso Brasileiro do Concreto (IBRACON-51), Curitiba-Brazil, 2009
Plenary Lecture on "Energy emissions from fracture of concrete: Acoustic, electromagnetic, piezonuclear", 7th International Conference on Fracture Mechanics of Concrete and Concrete Structures", Jeju-Korea, 2010
Opening Lecture on "Evidence of piezonuclear fission reactions: Neutron emissions, microchemical analysis, geological transformations", 9th Youth Symposium on Experimental Solid Mechanics, Trieste-Italy, 2010
Honorary Lecture on "Dimensional analysis and fractal modelling of fatigue crack growth", ASTM Fracture and Fatigue Conference, Anaheim-California, USA, 2011
Closing Lecture on "Piezonuclear reactions produced by brittle fracture: From laboratory to planetary scale", 19th European Conference on Fracture, Kazan-Russia, 2012
Opening Lecture on "Failure mode scaling transitions in reinforced concrete beams in flexure: Tensile, shearing, crushing", 8th International Conference on Fracture Mechanics of Concrete and Concrete Structures, Toledo-Spain, 2013
Honorary Presidential Lecture on "Piezonuclear fission reactions due to fracture and earthquakes: From the chemical evolution of our planet to the so-called cold fusion", 13th International Conference on Fracture, Beijing-China, 2013
Invited Lecture on "Piezonuclear fission reactions from fracture and turbulence: The chemical evolution in the planets of the Solar System", European Academy of Sciences, Toulouse-France, 2013
Distinguished Lecture in Solid Mechanics on "Acoustic, electromagnetic, and neutron emissions from brittle fracture and earthquakes", California Institute of Technology, Pasadena-California, USA, 2014
Invited Lecture on "Hydrogen embrittlement, microcracking, and piezonuclear fission reactions at the Ni and Pd electrodes of electrolysis "cold fusion" experiments", 12th International Conference on Nanostructured Materials, Moscow-Russia, 2014
Invited Seminar on "Acoustic, electromagnetic, and neutron emissions from brittle fracture and earthquakes", Perm State University, Perm-Russia, 2014
Keynote Lecture on "Opto-acoustic and neutron emissions from fracture and earthquakes", Annual Conference and Exposition on Experimental and Applied Mechanics, Costa Mesa-California, USA, 2015
Opening Lecture on "Static-kinematic duality in beams, plates, shells and its central role in the Finite Element Method", International Conference on Shells, Plates, Beams, Bologna-Italy, 2015

MAJOR RESEARCH GRANTS (LAST TEN YEARS)

In the last ten years, the following research grants exceeding Euro 500 000 were coordinated as:
(1) Project Leader, Italian Ministry of Education, Research and University, "Process Development, Innovative Methods of Implementing and Design of Composite High-tech and Coating Ceramic Materials" (PROMOMAT), 2002-2005
(2) Project Leader, Italian Ministry of Education, Research and University, "Fracture Mechanics Advanced Applications to Ductility and Durability of Reinforced or Retro-fitted Structural Elements" (PRIN), 2010-2012

(3) Project Leader, Regione Piemonte, "Preservation, Safeguard and Valorization of Masonry Decorations in the Architectural Historical Heritage of Piedmont" (RE-FRESCOS), 2010-2013

January 1st, 2016