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 – "A. Castigliano" Fracture Mechanics Laboratory, Politecnico di Torino, Torino-Italy, 1999-
Head, Engineering Division, European Academy of Sciences, Bruxelles-Belgium, 2016-

PREVIOUS 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

FURTHER 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

COMMISSIONS OF TRUST

Nominator, Japan Prize, 2016-
Nominator, Global Energy Prize, 2015-
Chair of the Awards Committee, International Congress on Fracture (ICF), 2013-2017
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 fourteen 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
"Curved and Layered Structures", 2016-
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

Life 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-
Life 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
Eminent Scientist Award, Wessex Institute of Technology (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-Pennsylvania, USA, 2011
Inaugural Paul Paris Gold Medal, International Congress on Fracture (ICF), Beijing-China, 2013
Doctorate Honoris Causa in Engineering, Russian Academy of Sciences, Moscow-Russia, 2016
Frocht Award, Society for Experimental Mechanics (SEM), Indianapolis-Indiana, USA, 2017
Honorary Professorship, Tianjin University, Tianjin-China, 2017

Founding Fellowship, Indian Structural Integrity Society (InSIS), Hyderabad-India, 2018

SUPERVISION OF POST-GRADUATE STUDENTS

Supervisor of over 30 Ph.D. Students. Presently, most of them are taking University positions in Italy or abroad: Five Full Professors, six Associate Professors, five Assistant Professors, seven Post-doctoral Fellows, three are currently PhD Students, whereas the remaining 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 since 1986:
Structural Mechanics (Electrical Engineering, 14 credits), 1986-1987
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 Instability 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 official 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

H-Index (Scopus) = 50
Total Citations (Scopus) = over 9000

Author of over 900 publications, of which more than 400 are papers appeared in Refereed International Journals, and 54 are authored or edited volumes, on the following research 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, buckling and snap-through in shallow roofing structures, tall buildings, seismic precursors, dynamics of macromolecular and protein structures

Four 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 (2014), XIV + 498
A. Carpinteri: Advanced Structural Mechanics, CRC Press (Taylor & Francis), Boca Raton (2017), XIII + 531

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 of cracked or damaged solids, the fatigue limit and threshold with the related scaling laws, the energy emissions from fracture phenomena and earthquakes

MAJOR INVITED PRESENTATIONS AT INTERNATIONAL CONFERENCES AND ADVANCED SCHOOLS (LAST FEW 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 few 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, 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
Invited Lecture on "LENR induced by nanomechanics instabilities and vibrations: From the geochemical evolution of the planet to cold fusion", Seminario ENEA sulle Reazioni Nucleari a Bassa Energia, Roma-Italy, 2016
Invited Lecture on "Nano-scale fracture phenomena and TeraHertz pressure waves as the fundamental reasons for geochemical evolution", 14th International Conference on Fracture, Rhodes-Greece, 2017
Honorary Professorship Lecture on "Fracto-emissions as seismic precursors", Tianjin University, Tianjin-China, 2017
Invited Lecture on "Size-scale transition from plastic collapse to brittle fracture", Tianjin University, Tianjin-China, 2018
Opening Lecture on "Scaling and fractality in fatigue crack growth: Implications to Paris Law and Woehler's Curve", 2nd Structural Integrity Conference and Exhibition (InSIS), Hyderabad-India, 2018

MAJOR RESEARCH GRANTS

In the last few years, the following research grants exceeding Euro 500,000 were coordinated as Project Leader:
(1) 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) 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) Regione Piemonte, "Preservation, Safeguard and Valorization of Masonry Decorations in the Architectural Historical Heritage of Piedmont" (RE-FRESCOS), 2010-2013

October 31, 2018