

Curriculum Vitae Prof. Massimo Cuomo

Professor Cuomo is full professor of Solids and Structural Mechanics, Scientific Sector ICAR08, since October 2002.

TEACHING EXPERIENCES

Presently teaches the course of Strength of Materials (Scienza delle Costruzioni), 9 CFU, in the undergraduate course for Industrial Engineering, and the course of Computational Mechanics in the graduate course for geotechnical and Structural Engineering (9 CFU).

Is coordinator of the PhD programme "Evaluation and mitigation of Urban and territorial hazards" of the University of Catania.

Has been tutor of many graduation theses and tutor of more than ten PhD students, also from foreign universities. Of his former PhD students four are currently Full or Associated Professor in national and international institutions, two are assistant professor in European Universities.

He has been the organizer of doctoral advanced courses for the University of Catania in the field of Structural Mechanics, among which the course "Finite Elements", held by prof. R.L. Taylor (University of California at Berkeley), the course "Inelastic Models", held by several professors, among whom, proff. C. Polizzotto, G. Romano, G. Borino, the course "Finite Elastic and Inelastic Deformations".

In 2016 and 2017 has held the course Computational Methods for Mechanical Problems for Master students of Production Engineering at Warsaw University of Technology (30 hrs).

SCIENTIFIC ACTIVITY

The research activity has been mainly developed in the field of Computational Mechanics of Solids and Structures. Among the research subjects covered in his activity are: non linear structural modeling with innovative numerical methods (isogeometric analysis, splines etc.), damage mechanics of solids and computational fracture mechanics, multi-physics modeling of materials subjected to mechanical and chemical actions, static and dynamic analysis of structures with material and geometric non linearities, elasto-plastic analysis in the field of finite deformations.

Has been coordinator of many research projects, especially PRIN and CNR projects and others

In the years 1993-1997 has been scientific coordinator of the research "Ancient building materials and building technologies of Eastern Sicily, with special interest for lava stones", sponsored by the National Secretariat for Cultural Heritage.

Has been scientific coordinator of a joint project with the Universitat Politècnica de Catalunya, Barcelona, of interchange projects with the Polytechnic of Helsinki and with the University of Nantes, of a French-Italian doctoral programme (en cotutelle) with Université de Marne La Vallée, Paris. Has been responsible for a Galileo Project of the Université Franco-Italienne. Is a member and actively cooperates with the international research centre M&MOCS, Mathematics and Mechanics of Complex Systems, for which has organized the conference "The new frontiers of glass: technological innovations, advanced applications for building industry and state of knowledge", 2011 and the workshop Computational Mechanics of Generalized Continua and Applications to Materials with Microstructure, Catania, 2015. Is coordinator of the section Computational mechanics of generalized continua (COMECH) of The Francois COSSERAT–Tullio LEVI–CIVITA INTERNATIONAL ASSOCIATED LABORATORY, which has received the recognition as Laboratoire

International Associ e by CNRS, promoted by F d ration Francilienne de M canique Mat riaux Structures et Proc d s CNRS FR 2009, France and by The International Research Center on Mathematics and Mechanics of Complex Systems (M&MOCS) Universit  Dell'Aquila, Italy.

Has been national coordinator of the Italian Group of Computational Mechanics (GIMC) in the years 2008 - 2013. and member of the General Assembly of ECCOMAS (European Congress on Computational Methods in Applied Sciences and Engineering.) and of the General Council of IACM (International Association of Computational Mechanics).

He is referee for many leading journal in solids and structural mechanics, among which Journal of European Mechanics A/Solids, International Journal of Solids and Structures, Computer and Structures, International Journal of Fracture, Int. J. Numer. Meth. Engn., ASCE J. Struct. Mech., CMAME etc., and has been referee for national and international research projects.

is member of the editorial board of Nanomechanics Science and Technology: An International Journal. Has been member of the editorial board of The open Numerical Methods Journal and

INSTITUTIONAL ACTIVITY

Is coordinator of the PhD programme "Evaluation and mitigation of urban and land risks", University of Catania, since 2014.

Presently is head of the Laboratory for Materials and Structures of the Department of Civil Engineering and Architecture of the University of Catania.

Has been dean of the Structural Engineering Division of the University of Catania in the period 2004-2007.

Is member of the scientific committee of the Research and Study Centre for the Culture of Risk, an interdisciplinary non-academic team.

Has participated to the scientific committee of the Italian Research Council for the preparation of the technical Document 210, "Instructions for the Design, Execution and Control of Constructions with Glass Structural Elements".

SOME RECENT PUBLICATIONS

Cuomo M, dell'Isola F, Greco LK, Rizzi N L (2017). First versus second gradient energies for planar sheets with two families of inextensible fibres: Investigation on deformation boundary layers, discontinuities and geometrical instabilities. COMPOSITES. PART B, ENGINEERING, vol. 115, 2017

Contrafatto L, Cuomo M, Gazzo S (2016). A concrete homogenisation technique at meso-scale level accounting for damaging behaviour of cement paste and aggregates. COMPUTERS & STRUCTURES, vol. 173, p. 1-18, 2016

Cuomo M, dell'Isola F, Greco L (2016). Simplified analysis of a generalized bias test for fabrics with two families of inextensible fibres. ZEITSCHRIFT FUR ANGEWANDTE MATHEMATIK UND PHYSIK, vol. 67, 61, 2016

Greco L and Cuomo M., An isogeometric implicit G1 mixed finite element for Kirchhoff space rods, accepted for publication in COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING, 2016

Greco L, Impollonia N, and Cuomo M., A procedure for the analysis of cable structures following elastic catenary theory, INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES, vol. 51, p. 1521-1533, 2014

CUOMO M. Contrafatto L and Greco L, A variational model based on isogeometric interpolation for the analysis of cracked bodies, INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE, vol. 80, p. 173-188, 2014

Fagone M, Ranocchiali G, Caggegi C, Briccoli Bati S, Cuomo M (2014). The efficiency of mechanical anchors in CFRP strengthening of masonry: An experimental analysis. COMPOSITES. PART B, ENGINEERING, vol. 64, p. 1-15, 2014

Greco L and CUOMO M., Consistent tangent operator for an exact Kirchhoff rod model, CONTINUUM MECHANICS AND THERMODYNAMICS, in press, 2014

Greco L and CUOMO M., An implicit G1 multi patch B-spline interpolation for Kirchhoff–Love space rod, COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING, 269, 173-197, 2014

Caggegi C., Pensée V, Fagone M, CUOMO M. and Chevalier L, Experimental global analysis of the efficiency of carbon fiber anchors applied over CFRP strengthened bricks, CONSTRUCTION AND BUILDING MATERIALS, 53, 203-212, 2014

Greco L and CUOMO M., B-Spline interpolation of Kirchhoff-Love space rods, COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING, 256, 251-269, 2013

Ciancio D and Carol I and CUOMO M., A method for the calculation of inter-element stresses in 3D, COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING, 254, 222-237, 2013

Cafiso S, CUOMO M., Di Graziano A and Vecchio C, Experimental Analysis for Piezoelectric Transducers. Applications into Roads Pavements, ADVANCED MATERIALS RESEARCH, 684, 253-257, 2013

Contrafatto L, CUOMO M. and Fazio F, An enriched finite element for crack opening and rebar slip in reinforced concrete members, INTERNATIONAL JOURNAL OF FRACTURE, 178, 33-50, 2012

GRECO L and CUOMO M., On the force density method for slack cable nets, INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES, 49, 1526-1540, 2012

CUOMO M. and Fagone M, Finite deformation non-isotropic elasto-plasticity with evolving structural tensors. A framework, IL NUOVO CIMENTO C, 032, 55-72, 2009

Contrafatto L and CUOMO M., A framework of elastic-plastic damaging model for concrete under multiaxial stress states, INTERNATIONAL JOURNAL OF PLASTICITY, 22, 2272-2300, 2006

CUOMO M. and Contrafatto L, A globally convergent numerical algorithm for damaging elasto-plasticity based on the Multiplier method, INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING, 63, 1089-1125, 2005

CUOMO M. and Contrafatto L, A new thermodynamically consistent continuum model for hardening plasticity coupled with damage, INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES, 39, 6241-6272,