

# Curriculum Vitae

**Name:** Francesco,

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## Affiliations

- Dipartimento di Ingegneria Strutturale e geotecnica (DISG) – Università degli Studi di Roma “La Sapienza”
- The International Research Center for the Mathematics & Mechanics of Complex Systems (M&MoCS) – Università degli studi di L'Aquila
- Research Institute for Mechanics, National Research Lobachevsky State University of Nizhni Novgorod

## Grant

**2018 to now** Winner of the grant from the Government of the Russian Federation (contract No. 14.Y26.31.0031)

## Degrees and distinctions

**1986** Laurea in Fisica (M.Sc.) Università di Napoli Federico II

**1992** Dottorato per la ricerca in Fisica Matematica (Ph.D.) Ministero per la Ricerca Scientifica e Tecnologica Roma Italia. Thesis title: Rational Thermodynamics of Nonmaterial Bidimensional Continua.

**1995** Qualification aux fonctions de Maitre de Conferences 60eme sect. n.9526040753 8/2/1995 Paris France

**2004** Adjunct Associate Professor Virginia Polytechnic Institute and State University

**2005** Idoneità Nazionale alle funzioni di Professore Ordinario, Commissione Nazionale presso Università di Roma La Sapienza. (Full professorship qualification)

Patent obtained by US Patent office. United States Patent 6546316. Two dimensional network of actuators for the control of damping vibrations. Net-Control systems of structural vibrations coinventors: Edmund Henneke, Stefano Vidoli

## Career and Teaching Activity

**1988-1991** Professore Incaricato (temporary appointment as Professor) del Corso Analisi Matematica II (Advanced Calculus) Facoltà di Scienze Economiche e Sociali Università del Molise Campobasso Italia

**1990-1993** Professore Incaricato (temporary appointment as Professor) del Corso di Biomeccanica Facoltà di Medicina – Università di Napoli Federico II

**1991-1992** Ricercatore s.s.d. Fisica Matematica (Tenured Assistant Professor) Facoltà di Scienza Matematiche-Fisiche e Naturali Università di Napoli Federico II

**1992-1998** Ricercatore s.s.d. (Tenured Assistant Professor) Scienza delle Costruzioni Facoltà di Ingegneria-Università di Roma La Sapienza

**1993** Maitre de Conferences Course in Solid Mechanics Université de Toulon et du Var

**1995** Maitre de Conferences Course in Continuum Mechanics Université de Aix-Marseille III

**1995-1998** Professore Supplente (temporary appointment as Professor) del Corso di Scienza delle Costruzioni Facoltà di Ingegneria - Università di Roma La Sapienza

**1998-2006** Professore Associato (Associate Professor) gruppo H07A Scienza delle Costruzioni Facoltà di Ingegneria - Università di Roma La Sapienza

**1998-to present** Member of the Doctoral School in Teoretical and Applied Mechanics (membro del Collegio dei Docenti del Dottorato in Meccanica Teorica ed Applicata) Università di Roma “La Sapienza”

**2000** Visiting Associate Professor Corso di Elasticità Virginia Polytechnical Institute and State University

**2005** Professeur invité à l’Université de Versailles

**2006-2009** Professore Straordinario di Scienza delle Costruzioni Facoltà di Ingegneria Università di Roma “La Sapienza”

**2009-to present** Professore Ordinario di Scienza delle Costruzioni Facoltà di Ingegneria Università di Roma “La Sapienza”

**2009** Membro del Consiglio Didattico–Scientifico del Master Internazionale di Secondo Livello Analisi e Controllo delle Vibrazioni in Applicazioni Civili ed Industriali, Università degli studi di Roma “La Sapienza”, Dipartimento di Ingegneria Strutturale e Geotecnica Dipartimento di Meccanica e Aeronautica

**2014-2015** Visiting Professor at Università degli Studi di Catania in the context of the course “piezo-electromechanical systems” coordinated by Prof. Massimo Cuomo

**2014-2016** In charge of the course “Mathematical Models for Engineering” at Warsaw University of Technology, (co-teaching with Prof. Tomasz Lekszycki).

**2018** Russell Severance Springer Professor at University of California, Berkeley, USA

### **Administrative Responsibilities**

**2003-2016** Scientific Responsible: Laboratorio Strutture e Materiali Intelligenti Cisterna di Latina

**2012 – to present** Member of the Executive Committee of the Research Center M&MoCS, University of L'Aquila

**2014 – 2018** Membre du Conseil scientifique de l'Institut des sciences de l'ingénierie et des systèmes – CNRS

**2015 – 2018** Member of the Council of the Research Center CERFIS, University of L'Aquila, as representative of the International Research Center M&MoCS Editorial Board Membership

**2016 – to present** Director of the International Research Center M&MoCS

### **Membership of Editorial Boards of International Journals**

**2018 – to present** Member of the Editorial Advisory Board of **Acta Mechanica**.

**2018 – 2020** Member of the Editorial Board of ZAMM – Journal of Applied Mathematics and Mechanics / Zeitschrift für Angewandte Mathematik und Mechanik.

**2017 – to present** Member of the Editorial Board of Journal Mechanics of Solids.

**2017-2020** Member of editorial board of Proceedings of the Royal Society A

**2014 – to present** Member of European Journal of Environmental and Civil Engineering (EJECE)

**2014 – to present** PNRPU Mechanics Bulletin

**March 2013** Guest Editor (with Samuel Forest) of the Special Issue of Continuum Mechanics and Thermodynamics. Pursuing the Progress of Mechanics, in the Spirit of the Founders, a Special Issue on the occasion of the retirement of Prof. Gianpietro Del Piero, Vol. 25, Issue 2-4, March 2013

**2013 – to present** Editor of Continuum Mechanics and Thermodynamics

**2012 – to present** Mathematics and Mechanics of Solids

**2012 – to present** Co-Founder of Mathematics and Mechanics of Complex Systems(M&MoCS)

**2012 – to present** The Book series of Modern Mechanics and Mathematics

**2002 – to present** International Journal of Electromagnetics and Mechanics

**2000 – to present** Research in Nondestructive Evaluation (RNDE)

### **Doctoral and Selection Committees**

Professor dell'Isola has been either supervisor or member of the Doctoral Committees for the following candidates:

**2000** – Dr Stefano Vidoli (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza). Title: “Structures and control: continuum integrated models”

**2002** – Dr Giulio Sciarra (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza — Docteur en Mécanique at Université du Sud-Toulon Var). Title: “Modeling of a fluid flux through a solid deformable matrix”

**2005** – Dr Maurizio Porfiri (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza — University of Toulon). Title: “Performances of passive electric networks and piezoelectric transducers for beam vibration control”

**2005** – Dr Corrado Maurini (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza — Université Pierre et Marie Curie, Ecole Doctorale SMAE). Title: “Piezoelectric composites for distributed passive electric control: beam modelling, modal analysis, and experimental implementation”

**2006** – Dr Maurizio Porfiri (Doctor of Philosophy in Engineering Mechanics at Virginia Polytechnic Institute and State University). Title: “Analysis by meshless local Petrov-Galerk in method of material discontinuities, pull-in instability in MEMS, vibrations of cracked beams, and finite deformations of rubber like materials”

**2006** – Dr Luca Placidi (Doctor of Philosophy in Theoretical and Applied Mechanics at the Department of Mechanical Engineering and Aeronautics University La Sapienza in Rome ). Title: “Microstructured Continua treated by Theory of Mixtures”

**2009** – Dr Angela Madeo (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza). Title: “Variational Techniques in Poroelasticity”

**2009** – Dr Lachouette Damien, at Institute de Mathématiques de Toulon et du Var, Université du Sud Toulon-Var, Toulon (France). Title: “Modélisation d’une interface fluide/solide avec érosion. Application à l’érosion interne”

**2010** – Dr Giuseppe Rosi (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza and Université Pierre et Marie Curie, (Paris 6), Institut Jean Le Rond d’Alembert, Spécialité Mécanique). Title: “Control of sound radiation and transmission by means of passive piezoelectric networks: modelling, optimization and experimental implementations”

**2011** – Dr Roberto Paccapeli (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza and Université Pierre et Marie Curie, (Paris 6), Institut Jean Le Rond d’Alembert, Spécialité Mécanique). Title: “Control for mechanical system in smart structures: variational approaches for detecting damage”

**2013** –Dr Daniel Ahmad (Doctor of Philosophy at Doctoral School MEGA, Université de Lyon). Title: “Analyse et simulation de film de la déformation defilm polymères de décoration au cours de leur miseen form”

**2014** – Dr Antoine Rallu (Doctor of Philosophy at the Laboratoire Génie Civil et Bâtiment (L.G.C.B.) – ENTPE/INSA de Lyon, France). Title: “Dynamique à basses et moyennes fréquences de milieux hétérogènes périodiques”

**2014** – Dr Daria Scerrato (Doctor of Philosophy in Theoretical and Applied Mechanics at Università di Roma La Sapienza and Doctoral School MEGA, LGCIE/INSA-Lyon, France, Spécialité Mécanique). Title: “Effect of micro-particle addition on frictional energy dissipation and strength of concrete: experiments and modelling”

**2014** – Dr Manuel Ferretti (Doctor of Philosophy in Ingegneria e Modellistica Fisico-Matematica at Università dell’Aquila and Doctoral School MEGA, LAMCOS/INSA-Lyon, France, Spécialité Mécanique). Title: “Non-linear mechanics of generalized continua and applications to composite materials”

**2014** – Dr George Noel Djoufedie (Doctor of Philosophy in Ingegneria e Modellistica FisicoMatematica at Università dell’Aquila, Italy). Title: “Non-strictly hyperbolic systems of conservations laws arising in oil recovery”

**2015**– Dr Khaled El Nady (Doctor of Philosophy at the École Doctorale Mécanique et Energétique de l’Université de Lorraine, Nancy, France). Title: “Nonlinear constitutive models for lattice materials by discrete homogenization methods at large strains. Application to membranes and textiles”

**2016** – Dr Julie AL-HOUT (Doctor of Philosophy at Doctoral School MEGA, INSA de Lyon). Title: “Etudes Expérimentales et Numériques du comportement des structures en Pisé et en Maçonnerie: Apport de la MED”.

**2016** – Dr Ba Tam TRUONG (Doctor of Philosophy at Doctoral School MEGA, INSA de Lyon). Title: “Formulation, performances mécaniques, applications du matériau TRC pour le renforcement et réparation de structure en béton/et béton armé: Approches expérimentale et numérique”.

**2017** – Dr Hilal REDA (Doctor of Philosophy at Doctoral School LEMTA - Laboratoire d’Energétique et de Mécanique Théorique et Appliquée, Université de la Lorraine, Nancy).

**2017** – Dr Mojtaba Biglar (Doctor in Mechanical Engineering, Politechnika Rzeszowska, Poland). Title: “*Strain state in neighbourhood of defects in piezo-electric ceramic material*”.

**2017** – Dr Anastasiya Vinakurava (Doctor in Mechanical Engineering, Politechnika Rzeszowska, Poland). Title: “*Modeling of bone and bioceramic materials for biomechanic analysis of the hip-implant considering micropolar plasticity*”.

**2017** – Dr Hao Xiong (Doctor in Computational geomechanics, IRSTEA Grenoble, France). Title: “*Multiscale modeling of granular materials in application to geotechnical engineering problems*”.

**2017** – Dr Sergei Khakalo (Doctor in Computational mechanics, Aalto University School of Engineerin, Finland). Title: “*Strain gradient continuum mechanics: simplified models, variational formulations and isogeometric analysis with applications*”.

**2018** – Dr Sara Bucci (Doctor in Mechanical Engineering, Otto von Guericke University Magdeburg, Germany).

**2018** – Dr Antoine Wautier (Docteur in Sciences por l’Ingénieur: Mécanique, Physique, Micro et Nanoélectronique, Aix-Marseille Université, France). Title: “*Analyse micro-inertielle des instabilités mécaniques dans les milieux granulaires, application à l’érosion interne. [Micro-inertial analysis of mechanical instability in granula materials with application to internal erosion]*”.

### **Other Memberships**

**2005**– Member of the Selection Committee for the assignment of a research fellowship of four years at the Dipartimento di Ingegneria Strutturale e Geotecnica, Università La Sapienza di Roma, sector ICAR /08 Scienza delle Costruzioni. Title: “Strutture Intelligenti: Modellazione e metodi per il controllo della risposta e dello stato di integrità strutturale”. Candidate: Dr Luca Placidi

**2006**– Member of the Selection Committee for the position of associate professor at the facoltà di INGEGNERIA, Università degli Studi di CATANIA, sector ICAR /08 Scienza delle Costruzioni

**2009**– Member of the Selection Committee for the assignment of a fellowship of three months at Dipartimento di Ingegneria Strutturale e Geotecnica, Università La Sapienza di Roma. Title: “Dinamica nonlineare di corpi continui soggetti a impatto”. Candidate: Dr Luca Placidi

**2010**– Member of the Selection Committee for the assignment of a research fellowship of one year at the Dipartimento di Strutture dell’Università ROMA TRE, sectors MAT/07, FIS/01 and ICAR /08 Scienza delle Costruzioni. Title: “Controllo attivo e passivo di vibrazioni in elementi strutturali tramite reti piezoelettriche: modellazione, sintesi e sviluppo sperimentale”. Candidate: Dr Luca Placidi

**2014**– Member of the Commission for the “Habilitation à diriger les Recherches” at Laboratoire des Sciences de l’Ingénieur de l’Informatique et de l’Imagerie (ICUBE), Strasbourg. Candidate: Dr Daniel George

**2014**– Member of the Selection Committee for the position of associate professor at the Dipartimento di Architettura, Università degli Studi di ROMA TRE, sector 08/B2 S.S.D. ICAR/08 Scienza delle Costruzioni

**2014**– Member of the Commission for the “Habilitation à diriger les Recherches” at LGCIE, INSA-Lyon, Villeurbanne, Lyon. Candidate: Dr Angela Madeo

**2016**– Member of the Commission for the “Habilitation à diriger les Recherches” at Université de Toulon, France. Candidate: Dr Luca Placidi

**2017**– Member of the Commission for the “Habilitation à diriger les Recherches” at Université Paris-Est Marne-La Vallée, Laboratoire MSME (UMR-CNRS 8208), France. Candidate: Dr Nicolas Auffray

## **Invited presentations**

### **1988**

1. two seminars at IPPT PAN, Warsaw June 1988

### **1991**

2. one seminar at the Vth International Meeting on Waves and Stability in Continuous Media, 1991

### **1994**

3. one seminar at LMM Université Pierre et Marie Curie, Paris VI, October 1994
4. one seminar at the 30th Polish Solid Mechanics Conference, Zakopane, 5-9 September 1994
5. one seminar at the CIRM – Centro Internazionale per la Ricerca Matematica, Trento (Italy), 7 December 1994. Title: “*Internal capillarity: microscopic bubbles*”

## **1995**

6. one seminar at Laboratoire d'Aérothermique du CNRS, GDR Fluides en Microgravité , Meudon, 25 September 1995
7. two seminars at the University of Rostock Institute for Mathematics, December 1995

## **1996**

8. two seminars at the Engineering Science and Mechanics Department Virginia TECH, February 1996
9. one seminar at Alenia Spazio S.p.A., Salaria, 1996-97. Title: *“Paralleli storici e formali fra la teoria del continuo deformabile e le equazioni di Maxwell: un'applicazione alla teoria della piezoelettricità per il progetto di strutture spaziali”*

## **1997**

10. one seminar at Alenia Spazio S.p.A., stabilimento Globalstar, 1997-98. Title: *“La teoria del continuo deformabile e le equazioni di Maxwell: applicazioni della piezoelettricità allo smorzamento di vibrazioni in travi reticolari”*
11. two seminars at the EUROMECH CONFERENCE n.366, ESSEN 1997
12. one seminar at the Conference Free Boundary problems: Theory and Applications, Crete 1997
13. one seminar on Piezoelectromechanical structures at Dipartimento di fisica Università di Napoli, March 1997

## **1998**

14. one seminar at Alenia Spazio S.p.A., stabilimento Globalstar, 1998-99. Title: *“Paralleli storici e formali fra la teoria del continuo deformabile e le equazioni di Maxwell: un'applicazione alla teoria della piezoelettricità per il progetto di strutture spaziali”*
15. one invited lecture at the Institute of Applied Mechanics (Civil Engineering) University of Stuttgart, February 1998
16. one seminar at the Department of Mechanics, Darmstadt University of Technology, February 1998

## **1999**

17. one seminar at Alenia Spazio S.p.A., stabilimento Globalstar, 1999-2000. Title: *“Controllo di vibrazioni per mezzo di attuatori piezoelettrici”*
18. one seminar at DISAT Università dell'Aquila, March 1999

## **2001**

19. one seminar on Net Control Systems at the Engineering School Leonard de Vinci (ESILV), Pole Universitaire Leonard de Vinci, Paris La Defense, September 2001
20. six lectures on Smart Structures at the AMAS Center of Excellence, Warsaw 2001

21. one seminar at the Conference in honour of Prof. K. Hutter's 60th birthday, Seeheim Germany 2001
22. one seminar on Applied Electromagnetics and Mechanics at 10th International Symposium, Tokyo Japan 13-16 May 2001

## 2002

23. one seminar at LMM Université Pierre et Marie Curie, Paris VI, June 2002
24. one invited lecture at the Conference "Contemporary Research in Theoretical and Applied Mechanics", Virginia Polytechnic Institute and State University, Blacksburg 23-28 June 2002
25. one seminar at 34th Solid Mechanics Conference, Institute of Fundamental Technological Research Center of Mechanics and Information Technology and Committee of Mechanics of the Polish Academy of Sciences, Zakopane 2-7 September 2002

## 2003

26. one seminar at the International Symposium on Applied Electromagnetics and Mechanics Versailles France 2003
27. one seminar at IUTAM Symposium on Physicochemical and Electromechanical Interactions in Porous Media, Eindhoven University of Technology Department of Biomedical Engineering, Congress Centre Rolduc, Kerkrade, The Netherlands 18-23 May 2003. Title: "*A second gradient model for deformable porous matrices filled with an inviscid fluid*"

## 2007

28. one seminar at 8e COLLOQUE NATIONAL EN CALCULUS DES STRUCTURES, 21-25 May 2007, Giens (Var). Title: "*Poutres composites piézoélectriques: modélisation des effets 3D, validations numériques et expérimentales*"
29. one seminar at ANLA Université de Toulon et du Var, June 2007
30. one presentation at the XXXI Convegno AMASES, Lecce Italy 3-6 settembre 2007

## 2009

31. one seminar at ANLA Université de Toulon et du Var, July 2009. Title: "*Piezoelectromechanical Structures: application to vibration damping*"

## 2010

32. one invited lecture at the Coussy Memorial Symposium, EMI California USC Viterbi School of Engineering, 8-11 August 2010
33. two seminars at Sperlonga Summer School on Mechanics and Engineering Sciences, Sperlonga (Italy), 20-24 September 2010. Titles: "*The Tetrahedon Argument for higher gradient theories*" and "*Flow in deformable porous media Boundary Conditions at Material properties discontinuity surfaces*"
34. one seminar at the Università degli Studi di Catania for the Dottorato di Ricerca in Ingegneria Strutturale e Geotecnica on 18 November 2010. Title: "*Stato di tensione nei continui di secondo gradiente. Applicazione ai sistemi continui 'microscopicamente' eterogenei*"



## 2011

35. one lecture at the Dipartimento di Fisica Università di Tor Vergata, Roma 17 gennaio 2011. Titolo del seminario: *“Principio dei Lavori Virtuali in Meccanica del Continuo”*
36. one lecture at Incontro Scientifico per il settantesimo compleanno del Prof. Antonio Romano, Napoli 3 febbraio 2011
37. one seminar at Laboratoire Sols Solides Structures Risques, Université Joseph Fourier, Grenoble 31 March 2011. Title: *“The variational approach in porous media”*
38. one seminar at Laboratoire IUSTI, Technopôle de Château-Gombert, Marseille 27 May 2011. Title: *“Contact actions in  $N$ -th gradient Continua an application to wave propagation”*
39. four seminars at Università degli Studi di Napoli “FedericoII” - Polo delle Scienze e delle Tecnologie- Dipartimento di Matematica e Applicazioni “Renato Caccioppoli”, Napoli 19 May 2011, 8-10 June 2011. Titles: *“Continui di  $N$ -simo gradiente. I concetti di geometria differenziale e teoria delle distribuzioni necessari alla formulazione di modelli coerenti”*
40. one seminar at Workshop on Vibrational energy transport and dissipation, National Science Foundation & University of Rome Faculty of Engineering of La Sapienza, Roma 6-7 June 2011. Title: *“Piezo-ElectroMechanical Structures”*
41. one seminar at the Università degli Studi di Perugia for the Dottorato di Ricerca in Ingegneria Civile e Materiali Innovativi on 24 June 2011. Title: *“Metodi Variazionali nella Meccanica del Continuo: Continui di ennesimo gradiente e applicazioni”*.
42. seminars at 2nd International Conference on Material Modelling incorporating the 12th European Mechanics of Materials Conference, Ecole des Mines de Paris, August 31st-September 2nd, 2011 Paris, France.
43. one seminar at Symposium in honour of Gianpietro Del Piero, First Sperlonga Summer School on Mechanics and Engineering Sciences, Sperlonga (Italy), 26-30 September 2011. Title: *“Contact actions in  $N$ -th gradient Continua”*
44. one seminar at Fédération francilienne de mécanique matériaux, structure, procédés, Ecole des Mines de Paris, October 13th, 2011 Paris, France. Title: *“The structure of contact actions in  $N$ -th gradient generalized continua: a generalization of the Cauchy tetrahedron argument”*
45. one seminar for the Workgroup Sistemi Complessi at the Dipartimento di Scienze Matematiche del Politecnico di Torino on 30 Novembre 2011. Title: *“A continuum model for the bio-mechanical interactions between living tissue and bio-resorbable graft after bone reconstructive surgery”*

## 2012

46. one seminar at Ecole Doctorale MEGA, INSA de Lyon, 25 January 2012. Title: *“Continuum models for microscopically heterogeneous materials: applications to concrete and porous media”*
47. one seminar of Physical Mathematics at Università Sapienza di Roma, 1 February 2012. Title: *“Strutture “micro” che producono comportamenti “macro” esotici: una introduzione ai continui generalizzati”*

48. one seminar über Fragen der Mechanik at EAM – Friedrich Alexander Universität, Erlangen, Nürnberg, 6 March 2012. Title: *“How contact interactions may depend on the shape of Cauchy cuts in  $N$ -th gradient continua: approach “à la D’Alembert”*

49. invited plenary lecturer at the 38th SOLID MECHANICS CONFERENCE, Warsaw University, 27-31 AUGUST 2012, Warsaw

50. one seminar at Ecole Doctorale Sciences de la terre et des planètes solides (STP), INSA de Lyon, 18 October 2012. Title: *“ $N$ -th Gradient continua: general theory and microscopic structures. Perspectives in wave propagation”*

## 2013

51. one seminar at Laboratoire Modélisation et Simulation Multi Echelle (MSME UMR8208 CNRS), Université Paris Est (Marne-la-Vallée), France, 15 May 2013. Title: *“Continuous Models for describing the complexity of growth phenomena in bone tissues reconstructed with bio-resorbable materials: how to account for microstructures?”*

52. one seminar at laboratoire Imath, Université du Sud Toulon-Var, Toulon (France), 23 May 2013. Title: *“Continuous Models for describing the complexity of growth phenomena in bone tissues reconstructed with bio-resorbable material: how to account for microstructures?”*

53. one seminar at Politecnico di Milano, Beltrami Room, organized by Prof. Umberto Perego, Department of Civil and Environmental Engineering, 25 June, 2013. Title: *“Analytical Continuum Mechanics à la Hamilton-Piola: Least Action Principle for Second Gradient Continua and Capillary Fluids”*

54. one seminar at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 23 July 2013. Title: *“Large Deformations in Isotropic Second Gradient Solids: Some Numerical Simulations Describing the onset of Boundary Layers”*

55. Chairman of Mini-Symposium on “Nonlinear Elasticity” at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 23 July 2013

56. one seminar at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 24 July 2013. Title: *“How Contact Interactions May Depend on the Shape of Cauchy Cuts in  $n$ -th Gradient Continua: Approach “À La D’Alembert””*

57. one seminar at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 25 July 2013. Title: *“Generalized Poynting Effects in Predeformed Prismatic Bars”*

58. Presentation of Professor Angelo Luongo, Plenary Lecture at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 25 July 2013. Title: *“On the Use of the Multiple Scales Method in Solving Difficult Bifurcation Problems”*

59. Chairman of Mini-Symposium on “One dimensional models of beams, cables and beam-like structures” at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 26 July 2013

60. Invited Lecture at SES Medal Symposium in honor of D.J. Steigmann, 50th Annual Technical Meeting and ASME-AMD Annual Summer Meeting, Brown University School of Engineering, (PROVIDENCE, RI), USA, 29 July 2013. Title: “*Analytical Mechanics of Continua with Microstructure*”

61. one seminar at LEMTA Laboratoire d’Energétique et de Mécanique Théorique e Applichée, Université de Lorraine, Nancy (France), 14 November 2013. Title: “*Higher gradient and Micromorphic continua: some applications to composites and growing tissues*”

## 2014

62. one seminar at University Center in Ajdovscina, University of Nova Gorica, Slovenia, 28 February 2014. Title: “*Research perspectives in design and applications of metamaterials, smart materials and structures to engineering problems*”

63. one seminar at Warsaw University of Technology, Faculty of Production Engineering, Warsaw, 8 April 2014. Title: “*Design and modelling of metamaterials: challenges from engineering sciences*”

64. a Keynote Presentation at International Conference on Structural Nonlinear Dynamics and Diagnosis, 19-21 May 2014, Agadir, Marocco. Title: “*Piezoelectromechanical Structures: a new concept for vibration control*”

65. two seminars at 17th U.S. National Congress on Theoretical and Applied Mechanics, Michigan State University, East Lansing, Michigan, June 15-20, 2014. Title1: “*Modelling fibrous composite reinforcements by second gradient theory: shear strain boundary layers and edge internal actions*”. Title2: “*Remarks on the 2014 Levi-Civita award for excellence in theoretical mechanics*”.

66. one seminar at Dipartimento di Ingegneria civile, chimica e ambientale (DICCA), Università degli studi di Genova, Genova 7 July 2014. Title: “*Verso la concezione e l’ottimizzazione di nuovi metamateriali: una sfida per le teorie meccaniche. Strutture Piezo-ElettroMeccaniche e Materiali di Secondo Gradiente*”

67. one seminar at IUTAM SYMPOSIUM 2014 Complexity of Nonlinear Waves, Tallinn, Estonia, 8-12 September 2014. Title: “*Variational methods for modelling non-linear effects in waves propagation in generalized continua*”

68. one seminar at Ecole Centrale de Lyon, France, 4 December 2014. Title: “*PiezoElectroMechanical (PEM) structures: the concept of distributed control of vibrations via piezoelectric transduction and analog electric waveguides*”

69. one seminar at Warsaw University of Technology, Faculty of Production Engineering, Warsaw, 27 October 2014. Title: “*Tissue growth and reconstruction with optimized meta materials. New concepts and Models*”

70. one seminar at WOKSHOP on Numerical methods for partial integro-differential equations modelling mechanical systems with nonlocal constitutive laws, ISTITUTO PER LE APPLICAZIONI DEL CALCOLO “MAURO PICONE” – Sede di Napoli, Italia, December 12, 2014. Title: “*Mechanical and biological systems with nonlocal constitutive laws*”

## 2015

71. PhD course held at Warsaw University of Technology, Warsaw, 19-31 January 2015. Title: *“Generalized continuum models with application to smart Structures, composites and biomechanics.”*
72. one seminar at INSA de Lyon, France, 17 February 2015. Title: *“The role of mathematical modeling in civil engineering and in particular in structural mechanics: why technological is impossible without scientific understanding.”*
73. one seminar at Laboratoire d'Énergétique et de Mécanique Théorique et Appliquée (LEMETA), Université de Lorraine, Nancy, France, 19 February 2015. Title: *“Variational peridynamics and higher gradient continuum mechanics. Some applications to composite reinforcements.”*
74. one seminar at MSME Biomécanique, Université Paris-Est, France, 3 March 2015. Title: *“Higher gradient and micromorphic continuum models: applications to microscopically highly inhomogeneous composites and growing tissues.”*
75. one seminar at Sciences et Techniques de L'Ingénieur STI, École Polytechnique Fédérale de Lausanne EPFL, Switzerland, 2 April 2015. Title: *“Microstructured  $n$ -th gradient continuum models including piezoelectric elements and electric circuits and some applications to acoustics.”*
76. Minisymposia invited speaker at INTERPORE, International Society for Porous Media, Padova University, Italy, 18-21 May 2015. Title: *“Models from Generalised continuum mechanics for porous media infused with mixtures of compressible fluids: theoretical methods and applications.”*
77. one seminar at Graduate School for Micro-Macro-Interactions in Structured Media and Particle Systems – GRK 1554, organized by OTTO VON GUERICKE UNIVERSITY MAGDEBURG, 8-12 June 2015, Berlin (German). Title: *“On Gradient Material.”*
78. one plenary lecture at the International Summer School “Advanced Problems in Mechanics”, Peter the Great St. Petersburg Polytechnic University, 22-27 June 2015, St. Petersburg, Russia. Title: *“Microstructured  $n$ -th gradient continuum models and some applications”.*
79. one seminar at 53rd Meeting of the Society for Natural Philosophy, University of Calgary, Canada, 19-21 August 2015.

## 2016

80. one seminar at European-Latin-American Conference of Theoretical and Applied Mechanics (ELACTAM-2016), University of Havana, Cuba, 22-24 February 2016.
81. one seminar at Mathematical Institute, University of Oxford, England, UK, 3 March 2016. Title: *“Non-linear continuum models for planar extensible beams and pantographic lattices of beams: Heuristic homogenization, experimental and numerical examples of equilibrium in large deformation”.*
82. one seminar at School of Mathematics and Statistics, University of Glasgow, Scotland, UK, 23 March 2016. Title: *“Large deformations of planar extensible beams and pantographic lattices: heuristic homogenization, experimental and numerical examples of equilibrium”.*
83. one plenary lecture at the International Summer School “Advanced Problems in Mechanics”, Peter the Great St. Petersburg Polytechnic University, 27 June-02 July 2016, St. Petersburg, Russia.

84. Short course on Metamaterials at the Alghero Summer School of the CNRS International Associate Laboratory Coss&Vita on “Elastic Metamaterials: From Theory to Applications”, Facoltà di Architettura, Università di Sassari, 22 – 29 May 2016, Alghero, Italy.

85. one Keynote lecture at the International Conference EMERGING TRENDS IN APPLIED MATHEMATICS AND MECHANICS, ETAMM 2016, LAMPS, Université de Perpignan, May 30-June 3, 2016, Perpignan, France. Title: “*Pantographic lattices as an example of higher gradient continua: Heuristic vs rigorous homogenisation, macroscopic vs microscopic models, experimental and numerical examples of equilibrium and Motion*”.

86. one seminar at GDRI GEOMECH Multi-Physics and Multiscale Couplings in Geo-environmental Mechanics, Université de La Rochelle, 20-22 June, 2016, La Rochelle, France. Title: “*Lagrangian discrete models for compact granular bodies: a method for describing the onset of force chains?*”.

87. one Keynote lecture at the 11th International Conference on Mathematical Problems in Engineering, Aerospace and Sciences, ICNPAA 2016, Université de La Rochelle, July 5 – July 8, 2016, La Rochelle, France. Title: “*Pantographic lattice based metamaterials: Modelling, prototype experiments and possible engineering applications*”.

88. one invited talk at Technische Universität Berlin, 9 November 2016, Germany. Title: “*Generalised Continua and the design of meta materials: numerics, experiments and theory*”.

## 2017

89. one seminar at LMT, ENS Cachan, Université Paris-Saclay, France, 19 January 2017. Title: “*The design of meta materials using generalized continua as mathematical models: numerics, experiments and theory*”.

90. one seminar at École Polytechnique Paris, France, 9 February 2017. Title: “*A new problem of old: Synthesis of Metamaterials. Theory, Numerics and Experiments*”.

91. one seminar at Warsaw University of Technology, Poland, 28 November 2017. Title: “*Metamaterials Extremely Resistant and Resilient To Large Deformations: Applications To Engineering And Perspectives Opened By 3d Printing Prototyping*”.

92. one seminar at Aalto University School of Engineering, Finland, 7 December 2017. Title: “*“Data-driven” or “Theory-driven”? An epistemological reflexion motivated by the need of designing exotic metamaterials*”

93. two seminars at IRSTEA (National Institute for Environmental Science and Research), 12 December 2017, Grenoble, France. Title 1: “*Pilotage par les données” ou “pilotage par la théorie”? Une réflexion épistémologique motivée par le besoin d’inventer des métamatériaux aux propriétés exotiques*”. Title 2: “*Data driven” or “Theory driven”? An epistemological reflexion motivated by the need of designing exotic metamaterials*”.

## 2018

94. one seminar at Department of Mechanical Engineering Russell Severance Springer Colloquium (University of California, Berkeley, USA), 17 January 2018. Title: “*Some Cases of Unrecognized Transmission of Scientific Knowledge: From Antiquity to Gabrio Piola’s Peridynamics and Generalized Continuum Theories*”.

95. one plenary lecture at the 46th International Summer School “Advanced Problems in Mechanics”, Peter the Great St. Petersburg Polytechnic University, June 25-30, 2018, St. Petersburg, Russia. Title: “*Description versus design: describing metamaterials and fabrics with continuum and/or discrete models*”.

96. one seminar at Institute of Nonlinear Mechanics (University of Stuttgart, Germany), 04 July 2018. Title: “*Differential Geometry of Embedded Manifolds and Contact Actions in Generalized Continua*”.

97. one invited lecture at GADeS Workshop, Università degli Studi di Cagliari, Italy, 21 September 2018. Title: “*Buckling modes in pantographic lattices*”.

98. one invited lecture at the Department of Mechanics and Mathematics of Lomonosov Moscow State University, Russia, 30 October 2018. Title: “*Some cases of Unrecognized transmission of scientific knowledge: from antiquity to Gabrio Piola’s Peridynamics and Generalised Continuum Theories*”.

## **2019**

99. one seminar at the Dipartimento di Fisica, Università degli studi di Napoli “Federico II”, Complesso di Monte Sant’Angelo, 8 January 2019. Title: “*Metamateriali: una sfida per la matematica dalla fisica e l’ingegneria*”.

100. one seminar at the Institute for Problems in Mechanics RAS, Russia, 15 February 2019. Title: “*Higher gradient continua: theoretical aspects and possible applications*”.

101. one seminar at the Moscow State University, Russia, 15 February 2019. Title: “*Pantographic metamaterials: A possible solution for some relevant technological problems*”.

## **International Conferences and Schools Organization**

1. 13th International Symposium on “Applied Electromagnetics and Mechanics (ISEM)”, September 9-12, 2007 Kellogg Center Michigan State University East Lansing, MI USA

2. Course CISM UDINE “Variational Models and Methods in Solid and Fluid Mechanics” Coordinators: Francesco dell’Isola (Rome, I), Sergey Gavrilyuk (Marseille, F) July 12- 16 2010

3. Scuola Estiva AIMETA/ Summer School of the Italian Association of Theoretical and Applied Mechanics in Sperlonga, 20-24 September 2010. “Anomalous Transport: from Billiards to Nanosystems” sponsored by Università di Roma La Sapienza CNR and Città di Sperlonga

4. Symposium at International Research Center M&MoCS on “Mechanics of Fractures and Second Gradient Theory”, Cisterna di Latina, July 4-8 2011

5. First Sperlonga Summer School on Mechanics and Engineering Sciences, Sperlonga (Italy), 26-30 September 2011. “Atomistic and continuum descriptions of microstructures”

6. Workshop at International Research Center M&MoCS on “Second Gradient and Generalized Continua”. Coordinators: Francesco dell’Isola (Sapienza Università di Roma), Samuel Forest (Paris, France). Cisterna di Latina, March 12-16, 2012

7. Second Sperlunga Summer School on Mechanics and Engineering Sciences, Sperlunga (Italy), 24-28 September 2012. “Mechanics and Thermodynamics of Soft Active Matter”
8. Member of International Scientific Committee at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 23-26 July 2013.
9. Member of Organizing Committee at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 23-26 July 2013.
10. Organizer of Minisymposium “Nonlinear Elasticity” (Dedicated to Richard Toupin, in recognition of his outstanding contribution to Mechanics) at 4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM 2013), McGill University (Montréal, Quebec), Canada, 23- 26 July 2013.
11. Third Sperlunga Summer School on Mechanics and Engineering Sciences, Sperlunga (Italy), 23-27 September 2013. “Dynamics, Stability and Control of Flexible Structures”
12. Organizer of Euromech-Colloquium 563 “Generalized Continua and their Application to the Design of Composites and Metamaterials”, Cisterna di Latina (LT), (Italy), 17-21 March 2014.
13. Member of Scientific Committee at 4th International Conference on Material Modeling, University of California, Berkeley, May 27-29, 2015
14. Member of Scientific Committee at the International Conference EMERGING TRENDS IN APPLIED MATHEMATICS AND MECHANICS.
15. Organizer of Workgroup on “From adaptive and architecture materials to integrated smart structures: a challenge in mechanical engineering and biomechanical applications. Arpino (FR), (Italy), 16-18 April 2015.
16. Organizer of Bilateral French-Italy Workshop on “Going down to the microscale in multiphysics problems from seismic driven risks to petroleum geomechanics. Arpino (FR), (Italy), 4-6 May 2015.
17. Organizer of Inaugural Summer School of the CNRS International Associate Laboratory Coss&Vita on Mechanics of generalized continua and their applications to engineering materials and structures, Arpino (FR), (Italy), 20-26 July 2015
18. Organizer of the Workshop on Computational Mechanics of Generalized Continua and Applications to Materials with Microstructure of the CNRS International Associate Laboratory Coss&Vita, Scuola Superiore di Catania, 29 – 31 October 2015, Catania.
19. Organizer of the Alghero Summer School of the CNRS International Associate Laboratory Coss&Vita on “Elastic Metamaterials: From Theory to Applications”, 22 – 29 May 2016, Alghero (Sardinia), Italy
20. Organizer of the School of the CNRS International Associate Laboratory Coss&Vita on “Models of Generalized Continua characterized by Quasi-Inextensible Fibrous Structures: New Ideas for Models and Applications”, 19-23 September 2016, Arpino, Italy
21. Organizer of EUROMECH-Colloquium 579 on “Generalized and microstructured continua: [new ideas in modeling] and/or [applications to structures with (nearly-)inextensible fibers]”, 3-8 April 2017, Arpino, Italy

22. Organizer of the Second Bilateral France-Italy Workshop on “Open issues and emerging approaches in geo-environmental mechanics”, 2-4 May 2017, Arpino (FR), Italy
23. Organizer of 5th International Conference on “Material Modelling” (ICMM5), 13-16 June 2017, Rome, Italy
24. Organizer of the France-Italy Workshop on “Bone biomechanics: multiscale and multiphysical aspects”, 26-28 September 2017, Giuliano di Roma (FR), Italy
25. Organizer of the Workshop “Encounter of the third kind” on “Generalized continua and microstructures”, 3-7 April 2018, Arpino (FR), Italy
26. Organizer of ICoNSoM 2019 International Conference on Nonlinear Solid Mechanics, 16-19 June 2019, Rome, Italy
27. Organizer of the Joint MEMOCS Workshop on "Models of Complex Materials and Systems, 20-23 June 2019, Arpino (FR), Italy

### **List of funded projects**

#### **2011**

Ricerche UNIVERSITARIE, Università di Roma “La Sapienza” - prot. C26A11E383. Title of the research: Dynamical performances optimization of structural members and structures constituted by innovative materials. Scientific responsible: DELL'ISOLA Francesco

#### **2010**

Ricerche UNIVERSITARIE, Università di Roma “La Sapienza” - prot. C26A103Z2J. Title of the research: Microstructures and networks in biology and structural mechanics. Scientific responsible: DELL'ISOLA Francesco

#### **2009**

Progetti di Ricerca di Università, Università di Roma “La Sapienza” - prot. C26A09PJNE. Title of the research: Propagazione di onde in mezzi porosi con discontinuità: applicazione allo studio di fenomeni sismici ed all'individuazione di riserve di fluido. Scientific responsible: DELL'ISOLA Francesco

#### **2006-2008**

PRIN2005, Protocollo: 2005094847\_003. Title: Modellazione e controllo delle incertezze in strutture intelligenti: controllo. Scientific responsible: DELL'ISOLA Francesco

#### **2008**

Progetti di Ricerca di Università, Università di Roma "La Sapienza"- prot. C26A08JW43. Title of the research: Metodologie di attenuazione delle vibrazioni e del rumore per mezzo di attuatori piezoelettrici. Scientific responsible: DELL'ISOLA Francesco



## Publications

### 2019

[179] I. Giorgio, F. dell'Isola and D. J. Steigmann "Edge Effects in Hypar Nets", *Comptes Rendus – Mécanique*, vol. 347 (2), 2019, pp. 114-123. [DOI: 10.1016/j.crme.2019.01.003]

### 2018

[178] I. Giorgio, F. dell'Isola and D. J. Steigmann "Axisymmetric deformations of a 2nd grade elastic cylinder", *Mechanics Research Communications*, Available online 8 September 2018. [DOI: <https://doi.org/10.1016/j.mechrescom.2018.09.004>].

[177] I. Giorgio, P. Harrison, F. dell'Isola, J. Alsayednoor and E. Turco "Wrinkling in engineering fabrics: a comparison between two different comprehensive modelling approaches", *Proceedings of The Royal Society A Mathematical, Physical and Engineering Sciences*, vol. 474 (2216), 2018, 20 pages, [DOI: 10.1098/rspa.2018.0063 ].

[176] F. dell'Isola, P. Seppecher, J. J. Alibert, T. Lekszycki, R. Grygoruk, M. Pawlikowski, D. Steigmann, I. Giorgio, U. Andreaus, E. Turco, M. Gołaszewski, N. Rizzi, C. Boutin, V. A. Eremeyev, A. Misra, L. Placidi, E. Barchiesi, L. Greco, M. Cuomo, A. Cazzani, A. Della Corte, A. Battista, D. Scerrato, I. Z. Eremeeva, Y. Rahali, J.-F. Ganghoffer, W. Müller, G. Ganzosch, M. Spagnuolo, A. Phaff, K. Barcz, K. Hoschke, J. Neggers and F. Hild "Pantographic metamaterials: an example of mathematically driven design and of its technological challenges", *Continuum Mechanics and Thermodynamics*, Available online 30 June 2018. pp. 1-34. [DOI: 10.1007/s00161-018-0689-8 ].

[175] E. Turco, A. Misra, M. Pawlikowski, F. dell'Isola and F. Hild "Enhanced Piola–Hencky discrete models for pantographic sheets with pivots without deformation energy: numerics and experiments", *International Journal of Solids and Structures*, Available online 17 May 2018. 34 pages. [DOI: 10.1016/j.ijsolstr.2018.05.015 ].

[174] V. E. Eremeyev and F. dell'Isola "A Note on reduced strain gradient elasticity", *Generalized Models and Non-classical Approaches in Complex Materials 1*, FIRST ONLINE: 25 March 2018. pp. 301-310 [DOI: 10.1007/978-3-319-72440-9\_15 ].

[173] F. dell'Isola and V. A. Eremeyev "Some introductory and historical remarks on mechanics of microstructured materials", *Advances in Mechanics of Microstructured Media and Structures*, FIRST ONLINE: 28 February 2018. pp. 1-20 [DOI: 10.1007/978-3-319-73694-5\_1 ].

[172] E. Barchiesi, F. dell'Isola, M. Laudato, L. Placidi and P. Seppecher "A 1D continuum model for beams with pantographic microstructure: Asymptotic micro-macro identification and numerical results", *Advances in Mechanics of Microstructured Media and Structures*, FIRST ONLINE: 28 February 2018. pp. 43-74 [DOI: 10.1007/978-3-319-73694-5\_4 ].

[171] F. dell'Isola "In Memoriam: Richard A. Toupin, 1926–2017", *Mathematics and Mechanics of Solids*, vol. 23 (2), 2018, pp. 133-135. [DOI: 10.1177/1081286517752589].

[170] A. Battista, A. Della Corte, F. dell'Isola and P. Seppecher "Large deformations of 1D microstructured systems modeled as generalized Timoshenko beams", *ZAMP – Zeitschrift für angewandte Mathematik und Physik*, Available online 06 April 2018, 26 pages

[169] A. Misra, T. Lekszycki, I. Giorgio, G. Ganzoschf, W. H. Müller and F. dell'Isola "Pantographic Metamaterials Show Atypical Poynting Effect Reversal", *Mechanics Research Communications*, vol. 89, 2018, pp. 6-10. (FIRST online 24 February 2018). [DOI: <https://doi.org/10.1016/j.mechrescom.2018.02.003>].

[168] S. R. Eugster and F. dell'Isola "Exegesis of Sect. III.B from "Fundamentals of the Mechanics of Continua" by E. Hellinger", *ZAMM – Journal of Applied Mathematics and Mechanics / Zeitschrift für Angewandte Mathematik und Mechanik*, 2018, 98(1), pp. 69-105.

[167] S. R. Eugster and F. dell'Isola "Exegesis of Sect. II and III.A from "Fundamentals of the Mechanics of Continua"

by E. Hellinger”, *ZAMM – Journal of Applied Mathematics and Mechanics / Zeitschrift für Angewandte Mathematik und Mechanik*, 2018, 98(1), pp. 31-68.

## 2017

- [166] S. R. Eugster and F. dell’Isola “An ignored source in the foundations of continuum physics “Die Allgemeinen Ansätze der Mechanik der Kontinua” by E. Hellinger”, *Proceedings in Applied Mathematics and Mechanics*, 22 May 2017, 2 pages.
- [165] V. A. Eremeyev, F. dell’Isola, C. Boutin and D. Steigmann “Linear pantographic sheets: Existence and uniqueness of weak solutions”, *Journal of Elasticity*, First Online: 06 November 2017, pp. 1-22. (DOI 10.1007/s10659-017-9660-3).
- [164] E. Turco, I. Giorgio, A. Misra, F. dell’Isola “King post truss as a motif for internal structure of (meta)material with controlled elastic properties”, *Royal Society Open Science*, Published 18 October 2017, 20 pages. (DOI: 10.1098/rsos.171153).
- [163] G. Ganzosch, F. dell’Isola, E. Turco, T. Lekszycki and W. H. Müller “Shearing tests applied to pantographic structures”, *Acta Polytechnica CTU Proceedings*, vol. 7, 2017, pp. 1-6. (DOI:10.14311/APP.2017.7.0001).
- [162] B. E. Abali, W. H. Müller and F. dell’Isola “Theory and computation of higher gradient elasticity theories based on action principles”, *Archive of Applied Mechanics*, FIRST ONLINE 05 June 2017, pp. 1-16. (DOI: 10.1007/s00419-017-1266-5).
- [161] G. Rosi, L. Placidi and F. dell’Isola ““Fast” and “slow” pressure waves electrically induced by nonlinear coupling in Biot-type porous medium saturated by a nematic liquid crystal”, *ZAMP – Zeitschrift für angewandte Mathematik und Physik*, vol. 68 (2), 2017, 14 pages.
- [160] M. Spagnuolo, K. Barcz, A. Pfaff, F. dell’Isola and P. Franciosi “Qualitative pivot damage analysis in aluminum printed pantographic sheets: Numerics and experiments”, *Mechanics Research Communications*, vol. 83, 2017, pp. 47-52.
- [159] A. Della Corte, A. Battista, F. dell’Isola and I. Giorgio “Modeling deformable bodies using discrete systems with centroid-based propagating interaction: Fracture and crack evolution”, *Mathematical Modelling in Solid Mechanics Volume 69 of the series Advanced Structured Materials*, 2017, pp. 59-88.
- [158] C. Boutin, F. dell’Isola, I. Giorgio and L. Placidi “Linear pantographic sheets: Asymptotic micro-macro models identification”, *Mathematics and Mechanics of Complex Systems*, vol. 5 (2), 2017, pp. 127–162. (DOI: 10.2140/memocs.2017.5.127).
- [157] I. Giorgio, U. Andreaus, F. dell’Isola and T. Lekszycki “Viscous second gradient porous materials for bones reconstructed with bio-resorbable grafts”, *Extreme Mechanics Letters.*, vol. 13, 2017, pp. 141-147. (DOI: 10.1016/j.eml.2017.02.008).
- [156] A. Della Corte, F. dell’Isola, R. Esposito and M. Pulvirenti “Equilibria of a clamped Euler beam (Elastica) with distributed load: large deformations”. *Mathematical Models and Methods in Applied Sciences*, vol. 27 (8), 2017, pp. 1391-1421.
- [155] I. Giorgio, A. Della Corte and F. dell’Isola “Dynamics of 1D nonlinear pantographic continua”, *Nonlinear Dynamics.*, vol. 88 (1), 2017, pp. 21-31. (First online: 29 November 2016). (DOI: 10.1007/s11071-016-3228-9).
- [154] M. Cuomo, F. dell’Isola, L. Greco and N. L. Rizzi “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, pp. 423-448. (DOI: 0.1016/j.compositesb.2016.08.043).
- [153] S. R. Eugster and F. dell’Isola “Exegesis of the Introduction and Sect. I from “Fundamentals of the Mechanics of Continua” by E. Hellinger”, *ZAMM – Zeitschrift für Angewandte Mathematik und Mechanik.*, vol. 97 (4), 2017, pp. 477-506. (First Published 17 November 2016). (DOI: 10.1002/zamm.201600108).
- [152] P. Boisse, N. Hamila, E. Guzman-Maldonado, A. Madeo, G. Hivet and F. dell’Isola “The bias-extension test for the analysis of in-plane shear properties of textile composite reinforcements and prepreps: a review”, *International Journal of Material Forming*, vol. 10 (4), 2017, pp. 473-492. (Published online: 11 April 2016). (DOI: 10.1007/s12289-016-1294-7).

2016

[151] U. Andreaus, F. dell'Isola, I. Giorgio, L. Placidi, T. Lekszycki and N. L. Rizzi "Numerical simulations of classical problems in two-dimensional (non) linear second gradient elasticity", *International Journal of Engineering Science*, vol. 108, 2016, pp. 34-50.

[150] F. dell'Isola, M. Cuomo, L. Greco and A. Della Corte "Bias extension test for pantographic sheets: numerical simulations based on second gradient shear energies", *Journal of Engineering Mathematics*, 2016, pp. 1-31 (DOI: 10.1007/s10665-016-9865-7).

[149] E. Turco, F. dell'Isola, N. L. Rizzi, R. Grygoruk, W. H. Müller and C. Liebold "Fiber rupture in sheared planar pantographic sheets: Numerical and experimental evidence", *Mechanics Research Communications*, vol. 76, September 2016 (First online: 1 August 2016), pp. 86-90. (DOI: 10.1016/j.mechrescom.2016.07.007).

[148] E. Turco, F. dell'Isola, A. Cazzani and N. L. Rizzi "Hencky-type discrete model for pantographic structures: numerical comparison with second gradient continuum models", *Zeitschrift für angewandte Mathematik und Physik*, vol. 67 (4), August 2016 (First online: 25 June 2016), 28 pages. (DOI: 10.1007/s00033-016-0681-8).

[147] F. dell'Isola, S. Bucci and A. Battista "Against the fragmentation of knowledge: The power of multidisciplinary research for the design of metamaterials", *Advanced Methods of Continuum Mechanics for Materials and Structures Volume 60 of the series Advanced Structured Materials*, 2016, pp. 523-545.

[146] F. dell'Isola, A. Della Corte, R. Esposito, L. Russo "Some cases of unrecognized transmission of scientific knowledge: From antiquity to Gabrio Piola's peridynamics and generalized continuum theories", *Generalized Continua as Models for Classical and Advanced Materials, Volume 42 of the series Advanced Structured Materials*, 2016, pp. 77-128.

[145] F. dell'Isola, V. A. Eremeyev and P. Schiavone "A special issue in honor of Prof. David Steigmann", *Continuum Mechanics and Thermodynamics*, vol. 28 (1), 2016, pp. 1-3.

[144] M. Cuomo, F. dell'Isola and L. Greco "Simplified analysis of a generalized bias-test for fabrics with two families of inextensible fibres", *Zeitschrift für angewandte Mathematik und Physik*, 2016, 39 pages. (DOI: 10.1007/s00033-016-0653-z).

[143] I. Giorgio, A. Della Corte, F. dell'Isola and D. J. Steigmann "Buckling modes in pantographic lattices", *Comptes Rendus – Mécanique*, vol. 344 (7), 2016 pp. 487-501. (DOI:10.1016/j.crme.2016.02.009).

[142] F. dell'Isola, A. Della Corte, I. Giorgio and D. Scerrato "Pantographic 2D sheets: Discussion of some numerical investigations and potential applications", *International Journal of Non-Linear Mechanics*, vol. 80, 2016, pp. 200-208.

[141] F. dell'Isola, D. Steigmann and A. Della Corte "Synthesis of fibrous complex structures: designing microstructure to deliver targeted macroscale response", *Applied Mechanics Reviews*, vol. 67 (6), 2016, 060804, 21 pages. (DOI: 10.1115/1.4032206).

[140] F. dell'Isola, A. Madeo and P. Seppecher "Cauchy tetrahedron argument applied to higher contact interactions", *Archive for Rational Mechanics and Analysis*, vol. 219 (3), 2016, pp. 1305-1341 (Published online before print September 2015).

[139] I. Giorgio, U. Andreaus, D. Scerrato and F. dell'Isola "A visco-poroelastic model of functional adaptation in bones reconstructed with bio-resorbable materials", *Biomechanics and Modeling in Mechanobiology*, vol. 15 (5), 2016, pp. 1325-1343. [Published online before print 30 January 2016] (DOI: 10.1007/s10237-016-0765-6).

[138] F. dell'Isola, I. Giorgio, M. Pawlikowski and N. L. Rizzi "Large deformations of planar extensible beams and pantographic lattices: heuristic homogenization, experimental and numerical examples of equilibrium", *Proceedings of the Royal Society of London A*, vol. 472 (2185), 2016, 23 pages.

[137] F. dell'Isola, A. Della Corte and I. Giorgio "Higher-gradient continua: The legacy of Piola, Mindlin, Sedov and Toupin and some future research perspectives", *Mathematics and Mechanics of Solids*, Published online before print January 14, 2016, 21 pages. (DOI: 10.1177/1081286515616034)

[136] F. dell'Isola, A. Della Corte, L. Greco and A. Luongo "Plane bias extension test for a continuum with two inextensible families of fibers: A variational treatment with Lagrange multipliers and a perturbation solution", *International Journal of Solids and Structures*, vol. 81, 2016, pp. 1-12.

[135] F. dell'Isola, M.V. d'Agostino, A. Madeo, P. Boisse and D. Steigmann "Minimization of shear energy in two dimensional continua with two orthogonal families of inextensible fibers: The case of standard bias extension test", *Journal of Elasticity* vol. 122 (2), 2016, pp 131-155. (Published online before print 09 July 2015).

[134] A. Della Corte, A. Battista and F. dell'Isola "Referential description of the evolution of a 2D swarm of robots interacting with the closer neighbors: Perspectives of continuum modeling via higher gradient continua", *International Journal of Non-Linear Mechanics*, vol. 80, 2016, pp. 209–220. (Published online before print 24 August 2015. DOI: 10.1016/j.ijnonlinmec.2015.06.016).

## 2015

[133] F. dell'Isola, I. Giorgio and U. Andreaus "Elastic pantographic 2D lattices: a numerical analysis on the static response and wave propagation", *Proceedings of the Estonian Academy of Sciences*, vol. 64 (3), 2015, pp.2219-225.

[132] F. dell'Isola, P. Seppecher and A. Della Corte "The postulations à la D'Alembert and à la Cauchy for higher gradient continuum theories are equivalent: a review of existing results", *Proceedings of The Royal Society A*, vol. 471 (2183), 2015, 25 pages.

[131] Y.Rahali, I. Giorgio, J.F. Ganghoffer and F. dell'Isola "Homogenization à la Piola produces second gradient continuum models for linear pantographic lattices", *International Journal of Engineering Science*, vol. 97, 2015, pp. 148-172.

[130] F. dell'Isola "Models to detect scientific creativity: Why something simpler than Fréchet Metric Manifolds?", *Mechanics and Mathematics of Solids (MMS)*, vol. 20 (9), 2015, pp. 1146-1149.

[129] N. Auffray, F. dell'Isola, V. Eremeyev, A. Madeo and G. Rosi "Analytical continuum mechanics à la Hamilton-Piola: least action principle for second gradient continua and capillary fluids", *Mechanics and Mathematics of Solids (MMS)*, vol. 20 (4), 2015, pp. 375-417. (Published online before print August 28, 2013).

[128] F. dell'Isola, U. Andreaus and L. Placidi "At the origins and in the vanguard of peridynamics, non-local and higher gradient continuum mechanics. An underestimated and still topical contribution of Gabrio Piola", *Mechanics and Mathematics of Solids (MMS)*, vol. 20 (8), 2015, pp. 887-928 (Published online before print February 2, 2014).

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Roma, li 10/09/2018