Education

- PhD in Structural Engineering, University of Rome "Tor Vergata", 2002.
- Laurea degree with honors in Electrical Engineering, University of Rome "Tor Vergata", 1997.
- Laurea degree with honors in Mathematics, University of Rome "Tor Vergata", 2005.

Research interests

Areas: Continuum Mechanics, Applied Mathematics, and Partial Differential Equations.
Topics: Beam and shell theories; shape-memory alloys; ferromagnetic materials; granular materials; plasticity; hydrogen storage; surface growth; Cahn-Hilliard systems.

Google Scholar Profile

Awards

2011 AIMETA Junior Prize in Solid Mechanics, awarded by the *Italian Association of Theoretical and Applied Mechanics*.

Membership

ISIMM: The International Society for the Interaction of Mechanics and Mathematics. Member since 2014, Secretary for 2018-2020

Project management

- 2007: Progetto Giovani GNFM (Young-Researcher Project funded by the Italian Research Group for Mathematical Physics):"Modelli multicampo per materiali con microstruttura:ferromagneti e cristalli liquidi nematici" (Multifield models for microstructured materials: ferromagnets and nematic liquid crystals. Duration: 12 months.
- 2009: Progetto Giovani GNFM: "Modellazione fisico-matematica di materiali e strutture intelligenti" (Mathematical-Physical Modeling of Smart Materials and Structures). Duration: 12 mesi.
- 2013: Progetto Giovani GNFM: "Modellazione matematica dei fenomeni di morphing." (Mathematical Modeling of Morphing Processes). Duration: 12 months.
- 2015: Progetto Giovani GNFM: "Progettazione ottimale di materiali soffici attivi." (Optimal design of soft active materials). Duration: 12 months.

Project participation

2006 Riorganizzazione Materiale e Microstrutture nei Materiali Polimerici e Ferromagnetici importo 2000?
L.Teresi G.Tomassetti G.Formica V.Varano M.Monteferrante A. Micheletti S.Vittorio M.Mancini

- 2008 Modellazione Fisico-Matematica dei Continui Elettro-attivi
- 2014: Progetti Giovani GNFM: "Matematica del controllo di forma nei materiali soffici." (Mathematics of shape control in soft materials) Duration: 12 months.
- 2016: Mathematical modelling of bio-hybrid and bio-inspired soft robots

Peer-reviewing

-Annals of Solid and Structural Mechanics
-Asymptotic Analysis
-Communications in Partial Differential Equations
-Communications on Pure and Applied Analysis
-Continuum Mechanics and Thermodynamics
-Journal of Elasticity
-Journal of Mechanics of Materials and Structures
-Journal of Nonlinear Science
-Journal of Sound and Vibration
-Meccanica
-Proceeding of the Royal Society A
-SIAM Journal of Mathematical Analysis
-Smart Materials and Structures
-Wave Motion

Other reviewing activity:

-AMS Mathematical Reviews

Organizazion of workshops:

- Minisymposium: "Partial differential equations in materials science" (organized with Lorenzo Giacomelli, SBAI Department, University of Rome "La Sapenza"), 7th European Conference on Elliptic and Parabolic Problems, Gaeta, Italy, May 2012.
- Workshop PMM2016 - "Physics and Mathematics of Materials: current insights".
  Links:
  http://www.gssi.infn.it/seminars/seminars-and-events-2016/item/769-mm16-pg75-physics-and-mathematics-of-materials-current-insights
  http://www.uniroma2.it/ppg/PMM2016/
- Mathematics and Mechanics: Natural Philosophy in the 21st Century, Oxford, 24th - 27th June 2018

Invited talks at conferences and meetings:

- Bologna, Sep. 2011, XX AIMETA Congress, "Giustificazione di teorie strutturali elementari a partire da modelli costitutivi non semplici" (Justification of elementary structural theories from constitutive models of non-simple materials).
- Udine, Sep. 2014, Università di Udine - Conference "Variational Modeling in Solid Mechanics". Talk: "Dissipative effects in strain-gradient plasticity: the case of simple shear.
- Brescia, Nov. 2014, Universit`a Cattolica del Sacro Cuore, Brescia, Italy - Meeting *The Powerful Continuum Mechanics*, in honor of Antonio di Carlo's 70th birthday. Talk: ``Morphoelastic rods''.
- Rome, May 2015, INdAM-ERC Workshop Special materials in complex systems SMaCS2015. Talk: A ''non-smooth regularization'' of the nonlinear diffusion equation
- Montecatini, Sep 2015, Italian INdAM-GNFM general assembly. Talk: "Accretion of an elastic body on a spherical support: the treadmilling regime".

Other talks:

- Ravello (Italy), Colloquium Lagrangianum (scienfic gathering of the members "Lagrange Laboratory"), Nov. 2002. Talk:"Effetto di tensione superficiale e trascinamento viscoso sul moto delle pareti dei domini magnetici" (Surface-tension and viscous effects in the motion of magnetic-domain walls).

- Ann Arbor (MI, USA), Oct. 2003, 40th Annual Technical Meeting Society of Engineering Science. Talk:"Motion by curvature of magnetic domain walls".
- Milan, Sep. 2003, 17th UMI (Italian Mathematical Union) Congress. Talk:"Equazioni di evoluzione di una parete di dominio in un corpo ferromagnetico indeformabile" (On the evolution equations of domain walls in undeformable ferromagnetic solids).
- Brixen (Italy), Dec. 2003, Mid-Term Gathering for Project COFIN2002 "Modelli Matematici per la Scienza dei Materiali" (Mathematical Models for Material Science). Talk: "Cylindrical domain walls in anisotropic ferromagnets".
- Ferrara, Dec. 2004, Mid-Term Gathering for Project COFIN2002 "Modelli Matematici per la Scienza dei Materiali" (Mathematical Models for Material Science). Talk: "An existence theorem for a non-local viscoplasticity model".
- Venice, Dec. 2004, Colloquium Lagrangianum. Title:"Esistenza di soluzioni per una teoria di gradiente per materiali elastoplastici isotropi" (Existence of solutions for a gradient-theory of elastoplastic isotropic materials).
- Montecatini (Italy), Apr. 2006, GNFM (Italian Research Group in Mathematical Physics) General Assembly. Talk: "Un modello matematico dei processi di spellamento, visti come propagazione di una frontiera di fase" (Peeling processes as phase-propagation fronts: a mathematical model).
- Scilla (Italy), Dec. 2006, Colloquium Lagrangianum. Talk:"Derivazione della teoria delle piastre di Reissner-Mindlin tramite Gamma convergenza" (Derivation of the Reissner-Mindlin Plate theory by Gamma convergence).
- Brescia, July 2007, Universita` Cattolica del Sacro Cuore, Department of Mathematics and Physics. Seminar: "Interazioni di contatto in materiali granulari" (On contact interactions in granular materials).
- College Station (TX, USA), Oct. 2007, 44th Technical Meeting of the Society of Engineering Science. Talk:"On a nonisothermal version of the Gilbert equation".
- Pittsburgh (PA, USA), Oct. 2007, Carnegie-Mellon University - Center for Nonlinear Analysis. Seminar: "On thermal effects in rigid ferromagnets".
- Rome, Apr. 2008, Meeting of the Multimat (Marie Curie MRTN-CT-2004-505226) Project. Talk: "Coupling Dynamics Micromagnetics with the Heat Equation".
- Catania, Oct. 2008, 8th GCM (Geometric Continua and Microstructures) Conference. Talk:"Continuum Modeling of the Ferro/Paramagnetic Transition in Ferromagnets".
- Rome, Jan. 2009, Final Meeting of the INTAS Project “Some Nonclassical Problems For Thin Structures”. Titolo:“Justification of theories of Shearable Beams and Plates by Variational Convergence from Micropolar Elasticity".
- Rome, Jan. 2009, Accademia dei Lincei, ACE’09 – 5th Workshop on Advanced Computational Electromagnetics. Talk: “Continuum mechanics and micromagnetics".
- Praga, March 2009, Charles University - Necas Center for Mathematical Modeling. Seminar:"Theories of Shearable Beams and Plates as Gamma-limits of three-dimensional Micropolar Elasticity".
- Ancona, Sep. 2009, XIX AIMETA Congress. Talk:"A model for shape-memory alloys accounting for electric conduction".
- Barcelona, Sep. 2009, COMPLAS X - International Conference on Computational Plasticity. Talk:"Analysis of a model for shape-memory alloys at large strains accounting for electric conduction".
- Prague, May 2010, Charles University - Necas Center for Mathematical Modeling. Talk: "From non-linear elasticity to linear elasticity with initial stress through Gamma-Convergence".
- Prague, May 2011, Charles University - Necas Center for Mathematical Modeling. Talk: "Energetic solutions of the torsion problem in strain-gradient plasticity".
- Udine, Feb. 2011, Gathering of the AIMETA Mechanics of Materials Research Group. Talk:"Torsion of a cylindrical bar in strain-gradient plasticity".

- Bologna, Sep. 2011, XX AIMETA Congress. Talk:"On configurational forces in linear beam theory".
- Trieste, Oct. 2011, SISSA (International School for Advanced Studies). Workshop on advances in the sciences of solid and engineering mechanics. Talk:"Energetic solutions of the torsion problem in strain-gradient plasticity".
- Hong-Kong, Aug. 2012, City University of Hong Kong - Mathematics Department. Chinese-Italian Bilateral Meeting on Mechanics. Talk: "On Korn' s constant for thin cylindrical domains".
- Prague, Dec. 2012, Charles University - Faculty of Mathematics and Physics. Talk: "Modeling hydrogen transport and phase transformation in metallic solids".
- Plzen, Dec. 2012, Center for New Technologies. Talk: "Modeling of transport processes in metal-hydrides. Application to hydrogen storage".
- Pavia, Jan. 2014, Universita` di Pavia - Mathematics Department. Talk: "Thermomechanics of hydrogen storage in metallic hydrides: modeling and analysis".
- Cassino, Jun. 2014, Universita` di Cassino - VII Meeting of the Mechanics of Material Group, Italian Associaton of Theoretical and Applied Mechanics. Talk: "Morphoelastic rods".
- Pavia, Jan. 2014, Universita` di Pavia - Mathematics Department. Talk: "Thermomechanics of hydrogen storage in metallic hydrides: modeling and analysis".
- Prague, Nov. 2014, Charles University - Faculty of Mathematics and Physics. Talk: ``Assessing energetic and dissipative effects in strain-gradient plasticity''.
- Trieste, Apr. 27 2015, SISSA. Talk: ``Accretion of an elastic body on a hard-spherical surface: the treadmilling regime''.
- Ravello, Sep. 26 2015, XXXX School of Mathematical Physics, organized by the Italian GNFM (National Group of Mathematical Physics). Talk: ``Eshelbian coupling in morphoelastic rods.", - Rio de Janeiro, UFRJ, Department of Mechanical Engineering, Seminar
- Prague, Dec. 21 2015, Charles University - Faculty of Mathematics and Physics. Talk: "Accretion of an actin layer on a spherical bead: the treadmilling regime."
- Prague, Dec. 19 2016, Charles University - Faculty of Mathematics and Physics. Talk: "A nonsmooth variant of the nonlinear diffusion equation."
- Talk Sapienza
- Bologna, Jul. 3 2018, European Solids Mechanics Conference. Talk: "A nonlinear theory for fibre-reinforced magneto-elastic rods."
- Arezzo, Jan. 25 2019, Giornate Signorini (workshop organized by Giuseppe Saccomandi). "Macroscopic and microscopic behavior of narrow elastic ribbons."
- Roma, Sep. 16 2019, XXIV Conference of the Italian Association of Theoretical and Applied Mechanics (AIMeTA). Title: "On the straight-helicoid to spiral-ribbon transition in thin elastic ribbons."

Participation to workshops:

CECAM-HQ-EPFL, Lausanne, Switzerland. Workshop: "Marrying continuum and molecular physics: the Andersen-Parrinello-Rahman method revised into a scale bridging device". May 23, 2016. Link: https://www.cecam.org/workshop-1347.html

Recent Advances in Mechanics and Mathematics of Materials, Rome, Italy, 18-20 Novembre 2019.

Other participation to conferences

Conference HySEA 2014. Rio de Janeiro, 26-30 Oct. 2014. Poster and presented paper: "Interaction between stress and diffusion in a spherical specimen: a model derived from the theory of configurational forces".

Visits

26/10-28/11/2015 - Visiting Scientist at Departamento de Engenharia Mecânica - POLI Universidade Federal do Rio de Janeiro, funded by a Bemundus Scholarship
Recent Visits:
3-11/4/2013 - Charles University in Prague, Faculty of Mathematics and Physics (on invitation of T. Roubicek)
1-16/6/2013 - Departamento de Engenharia Mecânica - POLI Universidade Federal do Rio de Janeiro (on invitation of F. Pereira Duda)
21-24/12/2013 - KAUST University of Science and Technology - Saudi Arabia. Department of Mechanical Engineering (on invitation of S. Chaieb)
1-14/4/2014 - Departamento de Engenharia Mecânica - POLI Universidade Federal do Rio de Janeiro (on invitation of F. Pereira Duda)
21-29/10/2014 - Departamento de Engenharia Mecânica - POLI Universidade Federal do Rio de Janeiro (on invitation of F. Pereira Duda)
01/03-3/4/2015 - Visiting Scholar at MIT Mechanical Engineering Department (on invitation of R. Abeyaratne)
29/03-12/04/2019 - Mathematics Department, National University of Ireland at Galway (on invitation of Michel Destrade)

Scholarships

Bemundus scholarship, from 25 Oct. 2015 to 28 Nov. 2015 at the Departamento de Engenharia Mecânica - POLI Universidade Federal do Rio de Janeiro.

Teaching

Undergraduate level (Laurea Triennale)

- "Scienza delle Costruzioni I/1" (Basic topics in Strength of Materials), fall 2002, fall 2004.
- "Meccanica dei Solidi 1" (Basic topics in Solid Mechanics), spring 2003.
- "Meccanica dei Continui" (Basic topics in Continuum Mechanics), one-semester course taught in 2004.
- Mechanics of Materials and Structures (Scienza delle Costruzioni): 9 ECTF credit course taught in Fall 2011, Fall 2012, and Fall 2014, at University of Rome TorVergata
- "Mechanics of Materials and Structures" (course taught in English), spring 2012, 2013, 2014.
- Mechanics of Materials and Structures (Scienza delle Costruzioni): 9 ECTF credit BSc-level course taught to MEng students in Spring 2017, Fall 2017, Fall 2019, and Fall 2019 at Universita` Roma TRE

Master Level (Italian Laurea Magistrale)

- "Scienza delle Costruzioni II/1" (First part of a course on Advanced topics in Strength of Materials)
- 2007-08 Scienza delle Costruzioni II (Full course on Advanced topics in Strength of Materials).
- Advanced topics in Strength of Materials (Complementi di Scienza delle Costruzioni), course taught at CEnd from the academic years 2008-09 to 2010-11, at University of Rome TorVergata
- Structural Dynamics (Dinamica delle Strutture) : 6 ECTF credit MSc-level course taught to CEng students in Spring 2017, Fall 2017, Fall 2018, Fall 2019 at Università Roma TRE

PhD Level

- 3-8 April 2017. Instructor in the Ph.D. level course *Hierarchical Multiscale Methods using the Andersen–Parrinello–Rahman Formulation of Molecular Dynamics* (HMM2017, https://groups.oi

st.jp/hmm) held at the Okinawa Institute of Science and Technology Graduate University.

- 7-8 May 2019. Instructor in the international Ph.D. level course "Understanding nonlinear problems in civil and industrial engineering", organized within the XP-resilience Project. (Project Reference: 721816, Call: H2020-MSCA- ITN-2016, Period: 09/2016 - 08/2020).

Theses supervision

- Nicola Pede, "Statica e dinamica dei processi di peeling" (Statics and dynamics of peeling processes), MSc Thesis Models and Systems Engineering, 2005 (co-advisor).
- Paolo Locatelli, "Adesione di strutture sottili a supporti rigidi" (Adhesion of thin structures on rigid supports), MSc Thesis in Civil Engineering, 2007 (advisor).
- Manuel Angelini, "Instabilita' di piastre piezoelettriche" (Instability of piezoelectric plates), Laurea degree in Civil Engineering, 2011 (advisor).
- Francesco De Santis, "Modello Matematico per la descrizione della biomeccanica vegetale" (A Mathematical Model for Plant Biomechanics), Laurea degree in Construction Engineering, 2013 (advisor).
- Giordano Martufi, "Travi Morfoelastiche" (Morphoelastic rods), Laurea degree in Construction Engineering, 2013 (advisor).
- Daniele Perugia, "The finite-element method", Laurea degree in Engineering Sciences, 2013 (advisor).
- Ivan Benemerito, "Modeling of orbital recostruction implants", MSc Thesis in Mathematical Engineering, 2014 (advisor).
- Luca Marinangeli, "Multiphysics simulation by the finite-element method", BSc Thesis in Engineering Sciences, 2014 (advisor).
- Alex Musarra, "Mechanical phase diagram of shrinking cylindrical gels", 2015 (advisor)
- Saad Moussa, "Continuum modeling in biomechanics", 2015, BSc Thesis in Engineering Sciences, 2015 (advisor).
- Mara Carbone, "I criteri di resistenza nella Scienza delle Costruzioni: sviluppi storici", BSc Thesis in Construction Engineering, 2016 (advisor)
- Pierluigi Morra, "A reduced order model for a hydrogel material", 2016, MSc Thesis in Mechanical Engineering (advisor).
- Christian Milano, "IL "CHAIN FOUNTAIN", BSc Thesis in Mechanical Engineering, Roma Tre University, 2017
- Chiara Lignola, "L'ELASTICA DI EULERO", BSc Thesis in Mechanical Engineering, Roma Tre University, 2017
- Luigi Fagiolo, "Funicolarità di strutture a guscio", BSc Thesis in Mechanical Engineering, Roma Tre University, 2017
- Davide Viscione, "Anisotropic Shells", BSc Thesis in Mechanical Engineering, Roma Tre University, 2017
- Edoardo Braccini, "L'ELASTICA DI EULERO", BSc Thesis in Mechanical Engineering, Roma Tre University, 2018
- Francesca Mura: "REALIZZAZIONE E SPERIMENTAZIONE DI TRAVI MAGNETOELASTICHE", BSc Thesis in Mechanical Engineering, Roma Tre University, 2018
- Davide Renzi: "Introduzione alla meccanica delle strutture per le classi liceali", 2018
- Michele Falsi: "IL PENDOLO DI KAPITZA: ASPETTI SPERIMENTALI", BSc Thesis in Mechanical Engineering, Roma Tre University, 2018
- Alessio Mariti: "Analisi meccanica di strutture reticolari mediante l'utilizzo del Large Structure Set dell'azienda PASCO", Tesi di Laurea in Ingegneria Meccanica, Università Roma Tre, 2019

Other teaching

- Istructor of Electronics and Mathematics from 7/6/1998 to 12/4/1999 in the Corp of Engineers of the Italian Army.

Other qualifications

- Abilitazione alla professione di Ingegnere (Professional Engineering Qualification), 1997.
- Abilitazione all'insegnamento nella scuola secondaria (High-school Teacher Qualification) in Mathematics and Physics, 2001.