Emilio Barchiesi (last updated March 2018)

research interests: homogenization of periodic structures; structural mechanics; continuum mechanics; generalized continua; damage and fracture mechanics; variational methods; metamaterials; computational mechanics.

education

Nov. 2016–ongoing	*Ph.D. in Theoretical and Applied Mechanics*, Università degli Studi di Roma "La Sapienza"
July 2016	*M.Sc. in Mathematical Engineering*, Università degli Studi dell'Aquila, 110/110 cum laude
July 2011	*Diploma di Liceo Scientifico P.N.I.*, Liceo Scientifico Statale Evangelista Torricelli, 100/100 con lode.

employment

Apr. 2017–ongoing	*Teaching assistant for the course "Methods and Models of Structural Mechanics".* Corso di Laurea in Ingegneria Civile e Ambientale. Indirizzo Costruzioni, Estimo e Topografia. Università Telematica Internazionale Uninettuno.
July 2014–ongoing	*Consulente informatico.* Studio Legale Avv. Michele Bonetti & Partners.
June 2010–Aug. 2010	*Software developer.* Tecno Automazione s.r.l.

awards, scholarships and grants

July 2017	*Erasmus+ Staff Mobility Scholarship*, Tomsk State University of Architecture and Building
Nov. 2016–ongoing	*Ph.D. Scholarship*, Università degli Studi di Roma "La Sapienza"
Feb. 2016	*Premio Studio* (laurea triennale), Fondazione Enasarco
Jan. 2015–July 2016	*M.Sc. Scholarship*, Gran Sasso Science Institute
May 2012	*Premio ISWEEEP*, Federazione delle Associazioni Scientifiche e Tecniche
May 2011	*Honorary Award*, European Union Contest for Young Scientists.

other information

Computer skills	Mathematica, Matlab, Comsol Multiphysics
Language skills	Italian (mother tongue), English (advanced), French (basic)
Referee	M&MoCS, Mathematics and Mechanics of Solids, Mathematical Problems in Engineering, Continuum Mechanics and Thermodynamics, Proceedings of the Royal Society A
Affiliations	EUROMECH Research Institute for Mechanics, Lobachevsky State University of Nizhni Novgorod International Research Center M&MoCS

teaching activity

May 2017–Aug. 2017	*Teaching assistant for the joint travaux dirigés "Fluid Flows Through Porous Media using Comsol Multiphysics"*, M&MoCS – SeaTech, Ecole d'ingénieurs (Université de Toulon).
Apr. 2017–ongoing	*Teaching assistant for the course "Methods and Models of Structural Mechanics".* Corso di Laurea in Ingegneria Civile e Ambientale. Indirizzo Costruzioni, Estimo e Topografia. Università Telematica Internazionale Uninettuno.

experiences abroad

Nov. 2017–Mar. 2018	*Warsaw University of Technology.* Experimental and modeling activities concerning the mechanics of pantographic fabrics and their manufacturing by means of 3D-printing technology.
July 2017	*Tomsk State University of Architecture and Building.* Experimental and modeling activities concerning the mechanical behaviour of reinforced concrete bars subject to impact loading.
May 2012	Houston. International Sustainable World (Engineering Energy Environment) Project.
July 2011	London. London International Youth Science Forum.

technical reports and thesis supervision

June 2017	Perizia tecnica preliminare sull'analisi dell'algoritmo che gestisce il software della mobilità docenti per l'A.S. 2016/2017. Committente: Studio Legale Avv. Michele Bonetti & Partners.

Presentations at conferences (* speaker)

12. Placidi, L., Barchiesi, E. & Misra, A. *A variational scheme for damage elasto-plastic springs and applications to the granular micromechanics of cohesive materials.* Advanced modelling in particulate and cohesive materials. Lyon, 22 Jan. 2018 – Jan. 2018.

11. Placidi, L., Barchiesi, E. & Misra, A. *A variational approach for dissipative strain gradient continuum damage mechanics.* New developments in micropolar theory. Berlin, 06 Nov. 2017 – 08 Nov. 2017.

10. Barchiesi, E. & Placidi, L. *Remodeling in bone reconstructed tissues and description of finite heterogeneous interphases**. French-Italian Workshop. Bone biomechanics: multiscale and multiphysical aspects. Giuliano di Roma, 26 Sept. 2017 – 28 Sept. 2017.

9. Placidi, L. & Barchiesi, E. *Dispersive behaviour of bones with higher gradient poroelasticity.* French-Italian Workshop. Bone biomechanics: multiscale and multiphysical aspects. Giuliano di Roma, 26 Sept. 2017 – 28 Sept. 2017.

8. Barchiesi, E., Placidi, L. & Misra, A. *Mesh-dependency, stress-strain curves and their regularization for some benchmark problems in the setting of a new 2D strain gradient damage model**. ICMM5. 5^{th} International Conference on Material Modeling. Roma, 14 June 2017 – 16 June 2017.

7. Placidi, L., Barchiesi, E. & Misra, A. *A variational approach toward the derivation of Karush-Kuhn-Tucker conditions for a novel 2D strain gradient damage model.* ICMM5. 5^{th} International Conference on Material Modeling. Roma, 14 June 2017 – 16 June 2017.

6. Barchiesi, E., Placidi, L. & dell'Isola, F. *A numerical comparison between the (quasi-)inextensible pantographic beam model and the geometrically nonlinear Euler model**. ICMM5. 5^{th} International Conference on Material Modeling. Roma, 14 June 2017 – 16 June 2017.

5. Placidi, L., Barchiesi, E. & dell'Isola, F. *Internal strain energy of a homogenized 1D continuum non-linear model for the description of "pantographic beams".* ICMM5. 5^{th} International Conference on Material Modeling. Roma, 14 June 2017 – 16 June 2017.

4. Placidi, L., Fortin, J. & Barchiesi, E. *Modelling dispersions and attenuations for a higher order saturated porous medium: the transitions from drained, undrained and unrelaxed regimes.* Second Bilateral French-Italy Workshop. Open issues and emerging approaches in geo-environmental mechanics. Arpino, 03 May 2017 – 05 May 2017.

3. Barchiesi, E., Placidi, L. & Fortin, J. *Numerical solutions of some boundary-value problems for 1D higher order saturated porous media**. Second Bilateral French-Italy Workshop. Open issues and emerging approaches in geo-environmental mechanics. Arpino, 03 May 2017 – 05 May 2017.

2. Placidi, L., Barchiesi, E. & dell'Isola, F. *Modelling "pantographic beams" by means of a nonlinear 1D second gradient continuum model.* EUROMECH COLLOQUIUM 579. Generalized and microstructured continua: new ideas in modeling and/or applications to structures with (nearly-)inextensible fibers. Arpino, 3 Apr. 2017 – 8 Apr. 2017.

1. Barchiesi, E., Placidi, L. & dell'Isola, F. *Numerically tackling the solution of the (nearly-)inextensible "pantographic beam" model by means of variational techniques**. EUROMECH COLLOQUIUM 579. Generalized and microstructured continua: new ideas in modeling and/or applications to structures with (nearly-)inextensible fibers. Arpino, 3 Apr. 2017 – 8 Apr. 2017.

Publications

11. Barchiesi, E., dell'Isola, F., Laudato, M., Placidi, L., & Seppecher, P. (2018). A 1D Continuum Model for Beams with Pantographic Microstructure: Asymptotic Micro-Macro Identification and Numerical Results. In *Advances in Mechanics of Microstructured Media and Structures.* Springer Singapore. DOI: http://dx.doi.org/10.1007/978-3-319-73694-5_4

10. Placidi, L. & Barchiesi, E. (2018). Energy approach to brittle fracture in strain-gradient modelling. *Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Sciences.* Royal Society. DOI: http://doi.org/10.1098/rspa.2017.0878

9. Barchiesi, E., Spagnuolo, M. & Placidi, L. (2018). Mechanical metamaterials: a state of the art. *Mathematics and Mechanics of Solids*. SAGE Publishing. DOI: http://doi.org/10.1177/1081286517735695

8. Barchiesi, E., Ganzosch, G., Liebold, C., Placidi, L., Grygoruk, R. & Müller, W.H. (2018). Out-of-plane buckling of pantographic fabrics in displacement-controlled shear tests: experimental results and model validation. *Continuum Mechanics and Thermodynamics*. DOI: http://doi.org/10.1007/s00161-018-0626-x

7. dell'Isola, F., Cazzani, A., Andreaus, U., Placidi, L. & Barchiesi, E. (2017). Piola, Gabrio. In *Encyclopedia of Continuum Mechanics*. Springer Berlin Heidelberg. DOI: http://doi.org/10.1007/978-3-662-53605-6_51-1

6. Placidi, L. , Barchiesi, E., Misra, A. & Andreaus, U. (2017). Variational Methods in Continuum Damage and Fracture Mechanics. In *Encyclopedia of Continuum Mechanics*. Springer Berlin Heidelberg. DOI: http://doi.org/10.1007/978-3-662-53605-6_199-1

5. dell'Isola, F., Barchiesi, E. & Placidi, L. (2017). Finite Dimensional Lagrangian Systems. In *Encyclopedia of Continuum Mechanics*. Springer Berlin Heidelberg. DOI: http://doi.org/10.1007/978-3-662-53605-6_200-1

4. Barchiesi, E., & Placidi, L. (2017). A review on models for the 3D statics and 2D dynamics of pantographic fabrics. In *Wave Dynamics and Composite Mechanics for Microstructured Materials and Metamaterials* (pp. 239–258). Springer Singapore. DOI: http://dx.doi.org/10.1007/978-981-10-3797-9_14

3. Placidi, L., Barchiesi, E. & Battista, A. (2017). An inverse method to get further analytical solutions for a class of metamaterials aimed to validate numerical integrations. In *Mathematical Modelling in Solid Mechanics* (pp. 193–210). Springer Singapore. DOI: http://dx.doi.org/10.1007/978-981-10-3764-1_13

2. Placidi, L., Barchiesi, E. & Della Corte, A. (2017). Identification of two-dimensional pantographic structures with a linear D4 orthotropic second gradient elastic model accounting for external bulk double forces. In *Mathematical Modelling in Solid Mechanics* (pp. 211–232). Springer Singapore. DOI: http://dx.doi.org/10.1007/978-981-10-3764-1_14

1. Placidi, L., Barchiesi, E., Turco, E. & Rizzi, N. L. (2016). A review on 2D models for the description of pantographic fabrics. *Zeitschrift für angewandte Mathematik und Physik*, 5(67), 1-20. DOI: http://dx.doi.org/10.1007/s00033-016-0716-1.