

## ***SCIENTIFIC CURRICULUM VITAE***

### **Maria Laura De Bellis**

Researcher unique identifier: [orcid.org/0000-0002-3004-8430](https://orcid.org/0000-0002-3004-8430)

Maria Laura De Bellis, is assistant professor at the Department of Engineering and Geology, at the University “G. d’Annunzio”, Chieti-Pescara (Italy).

**RESEARCH PRODUCTS AND BIBLIOMETRIC DATA** (updated on November 11th, 2021)  
74 scientific contributions: 26 articles in peer-reviewed international journals, 3 publication in Book Chapters, 7 peer-reviewed papers in conference proceedings, 3 Prefaces and 35 abstracts in conference proceedings.  
ResearchGate Score: 25.23  
Google Scholar: [maria laura de bellis - Google Scholar](#)

### **EDUCATION**

2009: Master POST\_LAUREAM in Metodos Numericos para Calculo y Diseno en Ingenieria. At CIMNE, International Center for Numerical Methods in Engineering, UPS, Barcelona, Spain.  
2008: Ph.D. in Structural Engineering at the University of Rome, “Sapienza”, with full approval by the members of the Examination Committee.  
2005: Full-Honors (110/110 cum laude) M. Sc. Degree (5 years) in Civil in Structural and Geotechnical Engineering at University of Rome, “Sapienza”, Italy.

### **CURRENT POSITION**

2019 – present: tenure track assistant professor in Solid Mechanics and Mechanics of Materials at University “G. d’Annunzio”, Chieti-Pescara (Italy).

### **PREVIOUS POSITIONS**

2015 – 2018: assistant professor in Solid Mechanics and Mechanics of Materials at University of Salento, Lecce (Italy)  
2014 - 2015: Research Associate, Department of Civil and Environmental Engineering, at Milan University of Technology, Italy.  
2009 - 2013: Research Associate in the Department of Structural and Geotechnical Engineering University of Rome, “Sapienza”, Italy.

### **PRIZES AND AWARDS**

-November 2020– Italian National Scientific Qualification for the role of Full Professor in “Scienza delle Costruzioni” (ICAR/08); unanimously granted by the five Commissioners.  
-Highly Cited Award 2015 from ISI-WEB of Knowledge for the paper: ‘Scale-dependent homogenization of random composites as micropolar continua’ (Eur. J. Mech./A-Solids, 49, 2015, 396-407).  
-Winner of a 12 months Humboldt Fellowship for Experienced Researcher. Institution: Humboldt Foundation.  
Experienced Researcher at the Institute of Continuum Mechanics at the Leibniz University, Hanover, Germany.

## RESEARCH PROJECT AND FUND-RAISING ACTIVITY

- Project Search for Excellence - Ud'A 2019 founded by University of Chieti-Pescara, project entitled “ High-performance active architected materials and metamaterials via 4D printing”. Total amount 80000 €.
- Project FIR “DEVELOPMENT OF NEXT GENERATION NEMS FOR ENERGY HARVESTING” NSUX1F1 (SSD ICAR/08), founded by Regione Puglia. Scientific advisor: Prof. Giorgio Zavarise. Dipartimento di Ingegneria dell'Innovazione, Università del Salento Institutional position RTDA January 16, 2018
- “Finanziamento annuale individuale delle attività base di ricerca (LEGGE 11 dicembre 2016, n. 232, art.1, commi 295-302).
- Progetto Giovani GNFM 2018, Istituto Nazionale di Alta Matematica "Francesco Severi". Total amount 2500 €.

## MEMBERSHIPS

- Member of the Mathematical Physics National Group (“Gruppo Nazionale per la Fisica Matematica”, GNFM) of the National Institute for Advanced Mathematics (“Istituto Nazionale di Alta Matematica”, INdAM).
- Member of the Italian Association of Theoretical and Applied Mechanics (“Associazione Italiana Meccanica Teorica e Applicata”, AIMETA).
- Member of European Mechanics Society EuroMech

## PI IN NATIONAL AND INTERNATIONAL RESEARCH PROJECTS

- Winner of the HPC GRANT for parallel calculus. Institution: CASPUR-MIUR. (2010)
- PI of the project FIR “DEVELOPMENT OF NEXT GENERATION NEMS FOR ENERGY HARVESTING” NSUX1F1 (SSD ICAR/08) founded by Regione Puglia. 2015-2018
- PI of the project "The Virtual Element Method for the study of the Nonlinear Multiscale Behavior of Heterogeneous Materials" founded by Alexander Von Humboldt Foundation at the Institute of Continuum Mechanics, Leibniz Universität Hannover (Germania). Supervisor Prof. Peter Wriggers (wriggers@ikm.uni-hannover.de). 2017-2018

## ORGANISATION OF SCIENTIFIC MEETINGS

- International Symposium on *Recent advances in mechanical modelling of microstructured composite materials and metamaterials* in 13th WCCM & Eccomas 2020, Virtual Congress, 11-15 January 2021.
- International Symposium on Multiscale and Multiphysics Modelling for Complex Materials MMCM10 in 13th World Congress on Computational Mechanics (WCCMXIII), 2018, 22-27 July, New York, USA.
- Special Session – *Recent advances in the mechanical modelling of composite materials and periodic structures* in mini-symposium Mechanics and Materials 2017, GMA – AIMETA 2017, 4-7 September, Salerno, Italy.
- GIMC-GMA 2016 – XXI National Conference of Computational Mechanics and the VIII Meeting of the AIMETA Materials Group, 27-29 June, Lucca, Italy (Member of Organizing Committee).
- Special Session – *Modelling of microstructured materials and metamaterials* in GIMC-GMA 2016 – XXI National Conference of Computational Mechanics and the VIII Meeting of the AIMETA Materials Group, 27-29 June, Lucca, Italy.
- Special Session – *Non-local modelling of materials* in mini-symposium Mechanics and Materials 2015, GMA – AIMETA 2015, 14-17 September, Genova, Italy.

## **INVITED LECTURES AND SEMINARS**

- Seminario DICA (Politecnico di Milano): "A Cosserat-based Multi-Scale Technique for Masonry Structures". Host: Proff. Anna Pandolfi ed Alberto Taliercio. 05-11-2009.
- MIG Seminar: "Multi-Scale Analysis Of Periodic And Random Composite Materials" at Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, USA. Host: Prof. Martin Ostoja-Starzewski. 31-10-2016.
- Institute Seminar IKM "A porous brittle damage material model with hierarchically distributed frictional-cohesive faults" at the Institute of Continuum Mechanics of the Leibniz University in Hannover. Host: Prof. Peter Wriggers. 08-05-2017.
- Institute Seminar IKM "Virtual element formulation for isotropic damage" at the Institute of Continuum Mechanics of the Leibniz University in Hannover. Host: Prof. Peter Wriggers. 07-05-2018.
- Invited Speaker at 1st GAMC-GIMC workshop on "Common research interests in computational mechanics. Organizzato da A. Reali, A. Pandolfi, S. Marfia, M. Kaliske. De Bellis M.L., Wriggers, P., Hudobivnic, B. and Zavarise, G., "Virtual element formulation for isotropic damage" from 28-02-2018 to 01-03-2018.
- Invited Speaker at ICCM 2018, Roma De Bellis M.L., Wriggers P., Hudobivnik B., Zavarise G. "Scalar Damage in 2D Solids: a VEM Formulation", from 06-08-2018 to 10-08-2018.
- Invited Speaker at the Congress of Stochastic Mechanics SM-MS 2016, Capri. De Bellis M.L., Trovalusci P., Masiani R., Reccia E., Ostoja-Starzewski M., "Sensitivity to material contrast and scaling measures in statistically based homogenization procedure for random composite materials", from 12-06-2016 to 15-06-2016.
- Invited Speaker at COMPLAS XI, Barcelona Taylor R.L. and De Bellis M.L., "Multiscale analysis of masonry structures" from 07-09-2011 to 09-09-2011

## **REFeree ACTIVITIES**

Referee of scientific papers for about 20 international journals.

## **PARTICIPATION TO RESEARCH PROJECTS**

- Project AST 2009. "Metodi computazionali per l'analisi della risposta sismica di strutture in Muratura". Università di Roma "Sapienza". Amount 15000 €. January 2009
- Project "Università 2010". "Modellazione della risposta sismica di strutture in muratura ed in cemento armato". Università di Roma "Sapienza". Amount 15000 €. January 2010
- Project "Università 2011". "Modellazione Multiscala Di Materiali Eterogenei Per Applicazioni Strutturali". Università di Roma "Sapienza". Amount 7000 €. January 2011.
- Project "Università 2013". "Modelli computazionali agli elementi finiti e codici di calcolo per l'analisi della risposta non lineare alle azioni sismiche delle strutture". Università di Roma "Sapienza". Amount 7000 €. January 2013.

## **Projects MIUR-PRIN**

2012 "Models and algorithms for the nonlinear analysis of structures and the validation of

performance-based design rules”, coordinated by R. Casciaro (University of Calabria).

Member of the local Research Unit “ Roma-Sapienza ” (2012-2015)

### **TEACHING ACTIVITY**

Teaching offices in Master courses:

-Master Mica (Master in Innovation in Design, Rehabilitation and Control of Structures, Assessment and Retrofitting in Seismic Areas) Università degli studi di Roma Tre, (Italy). Course "Introduction to the Finite Element Method and Nonlinear Structural Analysis."

Scientific Organizer: Prof. Camillo Nuti.

Teaching offices in Bachelor’s and Master’s degree courses:

-“Valle Giulia” Faculty at the University of Rome “Sapienza”, courses:

▪2012-2013. Statica ;

▪ 2011-2012 Modulo di Strutture nel corso "Laboratorio di Progettazione architettonica";

▪ 2009-2010. Meccanica delle Strutture .

-Department of Innovation Engineering , University of Salento, Italy

▪2015-2016 Scienza delle Costruzioni;

▪2016-2017 Scienza delle Costruzioni;

▪2017-2018 Scienza delle Costruzioni;

Department of Architecture, University of Chieti-Pescara

2019-2020 Statica delle Strutture

2020-2021 Statica delle Strutture

2021-2022 Statica delle Strutture

Department of Engineeringd Geology ,University of Chieti-Pescara

2020-2021 delle Costruzioni

### **RESEARCH FIELDS AND ACTIVITY**

The main activities carried out were devoted to: definition and application of innovative multi-scale techniques based on computational and asymptotic homogenization, considering both periodic and random microstructures; implementation of a multi-scale Finite Element Code, based on parallel computing, for the structural analysis of composite materials; use of micropolar continua for the modelling and simulation of composite structures in order to study the dependence of the structural response on length scale parameters; implementation of local and nonlocal damage models to reproduce complex non-linear structural behaviours (especially for masonry structures); study and implementation of regularization techniques in the presence

of strain softening behaviour; study of the dynamic behaviour of structural elements undergoing follower forces and resting on different types of foundations; development and analysis of mixed finite elements (based on Hellinger-Reissner and Hu-Washizu principles). Theoretical study and the numerical implementation of a multiscale finite element code, based on coupling between fractures development and permeability changes in nonconventional reservoirs undergoing hydraulic fracking. Definition and implementation of innovative Virtual Elements for the solution of the modelling of softening behaviour of quasi brittle materials.