

ELIO SACCO

CURRICULUM VITAE

Elio Sacco

Email : sacco@unicas.it

Web-page: <https://www.docenti.unina.it/elio.sacco>

RESEARCH UNIQUE IDENTIFIER

ResearcherID: G-5349-2017

ORCID: <https://orcid.org/0000-0002-3948-4781>

RESEARCH PRODUCTS AND BIBLIOMETRIC DATA (UPDATED AT FEBRUARY 12, 2020)

Scopus	Documents	176
	Citations	3596
	h-index	33
Google Scholar	Documents	290
	Citations	5392
	h-index	39

5 MOST CITED PAPERS

- Luciano, R., Sacco, E. Homogenization technique and damage model for old masonry material. *International Journal of Solids and Structures*, 34 (24), pp. 3191-3208. (1997) DOI: 10.1016/S0020-7683(96)00167-9 (186 citations Scopus)
- Auricchio, F., Sacco, E. A one-dimensional model for superelastic shape-memory alloys with different elastic properties between austenite and martensite. *International Journal of Non-Linear Mechanics*, 32 (6), pp. 1101-1114. (1997) DOI: 10.1016/S0020-7462(96)00130-8 (181 citations Scopus)
- Alfano, G., Sacco, E. Combining interface damage and friction in a cohesive-zone model. *International Journal for Numerical Methods in Engineering*, 68 (5), pp. 542-582. (2006) DOI: 10.1002/nme.1728 (162 citations Scopus)
- Valluzzi, M.R., Oliveira, D.V., Caratelli, A., Castori, G., Corradi, M., De Felice, G., Garbin, E., Garcia, D., Garmendia, L., Grande, E., Ianniruberto, U., Kwiecień, A., Leone, M., Lignola, G.P., Lourenço, P.B., Malena, M., Micelli, F., Panizza, M., Papanicolaou, C.G., Prota, A., Sacco, E., Triantafillou, T.C., Viskovic, A., Zajac, B., Zuccarino, G. Round Robin Test for composite-to-brick shear bond characterization. *Materials and Structures/Materiaux et Constructions*, 45 (12), pp. 1761-1791. (2012) DOI: 10.1617/s11527-012-9883-5 (162 citations Scopus)
- Auricchio, F., Di Loreto, M., Sacco, E. Finite-element analysis of a stenotic artery revascularization through a stent insertion. *Computer Methods in Biomechanics and Biomedical Engineering*, 4 (3), pp. 249-263. (2001) DOI: 10.1080/10255840108908007 (140 citations Scopus)

CURRENT POSITION

2017- Professore Ordinario (full professor with tenure) di Scienza delle Costruzioni (Solid and Structural Mechanics), Department of Structures for Engineering and Architecture, University of Naples "Federico II"

CURRENT TEACHING COURSES

- Scienza delle Costruzioni (Solid and Structural Mechanics), Bachelor in Mechanical Engineering, University of Naples “Federico II”
- Micromechanics of heterogeneous materials, Master in Structural and Geotechnical Engineering, University of Naples “Federico II”
- Micromechanics, homogenization and multiscale analysis of composite materials, PhD in Ingegneria strutturale, geotecnica e rischio sismico, University of Naples “Federico II”
- Modeling of cohesive interfaces, PhD in Methods, Modeling and Technologies for the Engineering, University of Cassino and Southern Lazio

PREVIOUS ACADEMIC POSITIONS

- 2000-2017 Professore Ordinario (full professor with tenure) di Scienza delle Costruzioni (Solid and Structural Mechanics), Department of Civil and Mechanical Engineering, University of Cassino and Southern Lazio
- 1992-2000 Associate professor of Solid and Structural Mechanics, Dipartimento di Ingegneria Industriale, Università di Cassino
- 1986-1992 Assistant professor of Solid and Structural Mechanics, Dipartimento di Ingegneria Civile, Università di Roma “Tor Vergata”

EDUCATION

January 1980: Laurea (5 years MS), 110/110 cum laude, Civil Eng., University of Naples “Federico II”, Italy.

ABROAD RESEARCH EXPERIENCES

- Sept. – Oct. 2013 Professeur invité, Centre National de la Recherche Scientifique, LMA Marseille (France)
- Sept. – Oct. 2012 Professeur invité, Centre National de la Recherche Scientifique, LMA Marseille (France)
- Sept. – Oct. 2011 Enseignant invité, École Centrale Marseille, Marseille (France)
- Sept. – Nov. 2009 Enseignant invité, École Centrale Marseille, Marseille (France)
- Sept. – Oct. 2008 Enseignant invité, École Centrale Marseille, Marseille (France)
- Dec. 92 – Feb. 93 Professeur Associée, “Département de Mathématiques”, Conservatoire National des Arts et Métiers (France)
- June – July 1991 Visiting Professor at Dept. of Aerospace and Mechanical Engineering, West Virginia University in Morgantown (U.S.A)
- Jan. – April 1990 Scientist Visiting at Dept. of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University in Blacksburg (U.S.A.)
- Feb. – April 1988 Scientist Visiting at Dept. of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University in Blacksburg (U.S.A.)

MAIN RESEARCH TOPICS

Elio Sacco covered a wide range of subjects in the fields of solids and structural mechanics and of mechanics of materials, with particular reference to theoretical and computational problems relevant to nonlinear material responses. The main scientific results are in the subjects:

- i) Material constitutive modeling: static and dynamic response for cohesive and ductile materials, advanced materials (shape memory alloys).
- ii) Micromechanics and homogenization techniques: analysis of composite materials characterized by nonlinear behavior of the constituents.
- iii) Multiscale analysis of heterogeneous structures: structural analyses developed considering different scales, i.e. the scale of the structure and the scale of the material.
- iv) Mechanics of masonry materials and structures: development of specific constitutive laws, computational procedures for the analysis of masonry structures.
- v) Analysis of plate and shells: development of models and finite elements.

FELLOWSHIPS AND AWARDS

Jan. – April 1990 CNR-NATO (Italian National Research Council) scholarship for abroad research period at Polytechnic Institute and State University in Blacksburg (U.S.A.).

PLENARY AND SEMI-PLENARY LECTURES (FROM 2007)

- 2019 Keynote Lecture, Virtual Element Method for Inelastic and Fracture Mechanics Problems, VI International Conference on Computational Contact Mechanics - ICCCM 2019, Hannover (Germany) July 3-5 2019.
- 2019 Keynote Lecture, Multiscale formulations for in-plane and out-of-plane analysis of masonry elements, VI International Conference on Computational Modeling of Fracture and Failure of Materials and Structures – CFRAC 2019, Braunschweig (Germany), June 12-14, 2019.
- 2018 Plenary Lecture, Computational Models for Masonry Structures, International Conference on Computational Methods - ICCM 2018, Rome (Italy), August 6-10, 2018.
- 2015 “A coupled damage-friction interface model accounting for interlocking effect”, Colloquium Lagrangianum 2015, ENSTA ParisTech, Palaiseau, September 24-25, 2015. (Plenary Lecture)
- 2012 “Modeling issues of the FRP detachment phenomenon”, Virtual Testing of Materials and Structures, Turin (Italy), October 8, 2015 (Keynote Lecture)
- 2011 “Considerations on the statics of masonry arches” Between Engineering and Architecture, Genoa, June 7-8, 2011. (Keynote Lecture)
- 2010 “Modeling of masonry structures” ECCM 2010 IV European Conference on Computational Mechanics, Paris, May 16-21, 2010. (Semi-plenary Lecture)
- 2009 “Cauchy and Cosserat equivalent continua for the multiscale analysis of periodic masonry walls” ECCOMAS Thematic Conference: ICCCM09 International

- Conference on Computational Contact Mechanics, Lecce, September 16-18, 2009. (Keynote Lecture)
- 2007 “A nonlinear homogenization procedure for periodic masonry” WONDERmasonry 2 Workshop on Design for Rehabilitation of Masonry Structures, Ischia - Lacco Ameno (Italy) October 11-12, 2007. (Keynote Lecture)
- “A coupled damage-friction interface model for cohesive crack propagation” Sixth Meeting Unilateral Problems in Structural Analysis Castello Maniace, Siracusa (Italy) June 7-9, 2007. (Keynote Lecture)

INVITED PRESENTATIONS (FROM 2007)

- 2020 Invited Lecture, Virtual Element Method: applications to nonlinear mechanics, homogenization and fracture mechanics, Workshop “VEM and elasticity”, Politecnico di Milano, February 5, 2020
- 2019 Invited Lecture, Modeling and analysis of masonry arches and strengthening techniques, Corso di Alta Formazione in: diagnostica e verifica strutturale di costruzioni storiche e monumentali "Marcello Ciampoli". DTC Lazio, Distretto Tecnologico Beni e Attività Culturali Centro di Eccellenza. Università di Cassino e del Lazio Meridionale, May 31, 2019
- 2018 Invited Lecture, Multiscale Models for Masonry, Dottorato di Ricerca in Ingegneria Strutturale e Geotecnica Corso sulle Costruzioni Esistenti in Muratura, Sapienza Università di Roma, June 16, 2018
- 2018 Invited Lecture, Micromechanical Models for Masonry, Dottorato di Ricerca in Ingegneria Strutturale e Geotecnica Corso sulle Costruzioni Esistenti in Muratura, Sapienza Università di Roma, June 15, 2018
- 2018 Invited Lecture, Homogenization of nonlinear composites based on FTA approach, 1st GACM-GIMC workshop “Common Research Interests in Computational Mechanics”, CISM Udine February 28 - March 1 2018.
- 2017 Invited Lecture, Computational modeling of masonry structures, Università degli Studi “Niccolò Cusano” Telematica Roma, November 14, 2017.
- 2017 Invited Lecture, Researches on the Mechanics of Materials and Structures: yesterday, today and ..., University of Naples “Ferdinando II”, October 27, 2017.
- 2017 Invited Lecture, Homogenization of heterogeneous beam, Università di Pavia, June 20, 2017.
- 2017 Invited Lecture, Computational modeling of masonry structures, Università di Roma “Sapienza”, June 15, 2017.
- 2017 Invited Lecture, Computational homogenization of composites subjected to plasticity, fracture and unilateral contact, Università di Firenze, April 4, 2017.
- 2016 Invited Lecture, Computational homogenization of composites subjected to plasticity, fracture and unilateral contact, Leibniz Universität Hannover, MUSIC Multiscale Methods for Interface Coupling, February 24, 2016.

- 2016 Invited Lecture, Computational homogenization of composites subjected to plasticity, fracture and unilateral contact, Technische Universität Braunschweig, February 22, 2016.
- 2016 Invited Lecture, Mechanics of Masonry Structures: Micro, Multiscale and Macro Models, Politecnico di Bari – PhD School, January 8, 2016.
- 2015 Plenary lecture, A coupled damage-friction interface model accounting for interlocking effect, Colloquium Lagrangianum 2015, ENSTA ParisTech, Palaiseau, September 24-25, 2015.
- 2015 Invited Lecture, An interface model coupling damage friction and unilateral effect, IMT Institute for Advanced Studies, Lucca, September 18, 2015.
- 2015 Invited Lecture, An interface model coupling damage friction and unilateral effect, Laboratoire de Mécanique et Génie Civil - CNRS/UM2, Montpellier, February 5, 2015.
- 2015 Invited Lecture, A corotational shell element for SMA devices, Centro Italiano Ricerche Aereospaziali CIRA, Capua, March 17, 2015.
- 2014 Invited Lecture, A Nonlinear Homogenization Technique for NiTi based Composite Materials, Brunel University, London, February 4, 2014.
- 2014 Invited series of Lectures Mechanics of Masonry Structures: Micro, Multiscale and Macro Models. Master in Earthquake Engineering, L'Aquila, January 24, 2014.
- 2013 Invited Lecture, Mechanics of Masonry Structures. University of Leeds (UK), Leeds, September 23, 2013.
- 2013 Invited Lecture, Mechanics of Masonry Structures: Micro, Multiscale and Macro Models. First French-Italian meeting on masonry, Laboratoire de Mécanique et d'Acoustique CNRS, Marseille October 24, 2013.
- 2013 Invited Lecture, A nonuniform TFA homogenization technique based on piecewise interpolation functions of the inelastic field, University of Palermo (Italy) April 22, 2013.
- 2012 Invited Lecture, Virtual Testing of Materials and Structures, University of Turin (Italy), October 8 2012.
- 2012 Invited Lecture, Recent Trends in experimental and Numerical Analysis of Masonry Structures, University of Roma 3, Rome (Italy), April 17 2012.
- 2011 Invited series of Lectures Mechanics of Masonry Structures. Course 394 - CISM International Centre for Mechanical Sciences, Udine (Italy).
- 2011 Invited Lecture, Analysis of SMART composite laminates. Ecole Centrale de Marseille (France).
- 2011 Invited Lecture, Between Engineering and Architecture – 2011. Study Days in honor of Edoardo Benvenuto, University of Genova (Italy).
- 2011 Invited series of Lecture, Specialized training course, Strategic Project PS_060, Department of Civil and Environmental Engineering, Polytechnic of Bari (Italy).
- 2010 Invited Lecture, Modeling of masonry structures, Department of Engineering, University of Ferrara (Italy).

- 2010 Semi-plenary Lecture, ECCM 2010 IV European Conference on Computational Mechanics, Paris (France).
- 2009 Invited Lecture, Modeling and analysis of masonry structures. Ecole Centrale de Marseille (France).
- 2009 Invited Lecture, Shape Memory Alloys: mechanical response, modeling and applications. Ecole Centrale de Marseille (France).
- 2009 Invited Lecture, Modeling and analysis of masonry structures. Course of Higher Education, Masonry Constructions: modeling, seismic safety and conservation of monuments and historic buildings. PhD School of Civil Engineering and Architecture, University of Rome “Sapienza” (Italy).
- 2009 Invited Lecture, Experimental and numerical analysis of masonry arches reinforced with FRP materials, Course on “The reinforcement of masonry arches”, University of Rome “Tor Vergata” (Italy).
- 2009 Keynote Lecture, ECCOMAS Thematic Conference: ICCCM09 International Conference on Computational Contact Mechanics, Lecce (Italy).
- 2008 Invited Lecture, Modeling and analysis of masonry structures. Ecole Centrale de Marseille (France).
- 2008 Keynote Lecture, Symposium on Advances in Composites and Layered Materials. Honouring Robert L. Sierakowski on his 70th birthday May 21-23, 2008 - Venice, Italy
- 2007 Invited Lecture, Multiscale approach in nonlinear structural mechanics. LMT-Cachan (France).

ORGANIZATION OF CONFERENCES AND SCIENTIFIC EVENTS (FROM 2007)

- 2020 Minisymposium on “New trends in the homogenization of nonlinear composites” in 14th World Congress in Computational Mechanics and ECCOMAS Congress, Paris (France), July 19-24, 2020.
- 2020 Minisymposium on “Masonry Constructions” in 14th World Congress in Computational Mechanics and ECCOMAS Congress, Paris (France), July 19-24, 2020.
- 2019 Minisymposium on “Interface models and phase-field approaches for fracture and damage mechanics” in AIMETA (Italian Association of Theoretical and Applied Mechanics), Rome (Italy), September 15-19, 2019.
- 2019 Minisymposium on “Masonry constructions: from material to structures, modelling and analysis approaches” in AIMETA (Italian Association of Theoretical and Applied Mechanics), Rome (Italy), September 15-19, 2019.
- 2018 Minisymposium on “Computational Modeling of Masonry Structures” in International Conference on Computational Methods - ICCM 2018, Rome (Italy), August 6-10, 2018.
- 2018 Minisymposium on “Computational Modeling of Masonry Structures” in 13th World Congress in Computational Mechanics - WCCM 2018, New York (USA), July 22-27, 2018.

- 2018 Minisymposium on “Computational Homogenization of Nonlinear Composites” in 10th European Solid Mechanics Conference – ESMC 2018, Bologna (Italy), July 2-6, 2018.
- 2017 Minisymposium on “Mechanical response of masonries: modeling and numerical procedure” in AIMETA (Italian Association of Theoretical and Applied Mechanics), Salerno (Italy), September 4-7, 2017.
- 2017 Minisymposium on “Fracture: interface models and phase field approaches” in AIMETA (Italian Association of Theoretical and Applied Mechanics), Salerno (Italy), September 4-7, 2017.
- 2017 FIMM4 French-Italian meeting on masonry, Rome “Sapienza”, January 27, 2017.
- 2016 Conference on the “Seismic Risk in the Southern Lazio”, Cassino, October 7, 2016.
- 2016 MCM 2016 Workshop on “Mechanics of Masonry Constructions”, Cassino, July 4 2016.
- 2015 Minisymposium on “Masonry modeling: from theory to numerical and simplified approaches”, in AIMETA (Italian Association of Theoretical and Applied Mechanics), Genova (Italy), September 14-17, 2015.
- 2014 GIMC-GMA 2014 – Cassino, June 11-13, 2014
- 2013 FIMM1 French-Italian meeting on masonry, Marseille, October 24-25, 2013.
- 2011 IGF XXI - Cassino, June 13-15, 2011.
- 2011 Minisymposium on “Recent developments in the mechanics of masonry structures”, in AIMETA (Italian Association of Theoretical and Applied Mechanics), Bologna (Italy), September 12-15, 2011.
- 2010 Minisymposium on “Computational Models for Masonry Structures” in ECCM 2010 IV European Conference on Computational Mechanics, Paris (France).
- 2008 Journée Scientifique “Développements scientifiques autour des problèmes posés par le bâti ancien”. Département Génie Civil Bâtiment, CNRS, Vaulx-en-Velin (France) 7 novembre 2008.
- 2007 Workshop ReLUIIS, Cassino 11-12 maggio 2007.

MEMBER OF SCIENTIFIC CONGRESS COMMITTEES (FROM 2007)

- 2018 The Thirteenth International Conference on Computational Structures Technology. Sitges, Barcelona (Spain) September 4-6, 2018
- 2018 Contact Mechanics International Symposium – CMIS 2018. Biella (Italy), May 16-18, 2018
- 2017 MuRiCo5, Mechanics of Masonry Structures Strengthened with Composite Materials. Bologna, June 28-30, 2017
- 2017 ICCCM17, International Conference on Computational Contact Mechanics, July 5-7 2017, Lecce, Italy
- 2015 ICCCM15, International Conference on Computational Contact Mechanics, 27-29 May 2015, Hannover, Germany
- 2014 MuRiCo4, Mechanics of Masonry Structures, Ravenna, September 9-11, 2014.

- 2013 International Workshop Multi-Scale Modeling and Characterization of Innovative Materials and Structures Cetara, Amalfi Coast - May 1-5, 2013
- 2012 ECCOMAS 2012, 6th European Congress on Computational Methods in Applied Sciences and Engineering. University of Vienna (Austria) September 10-14, 2012.
- 2010 ECCM IV, IV European Congress on Computational Mechanics: Solids, Structures and Coupled Problems in Engineering, Paris (France), 16-21 May 2010.
- 2010 XVII Italian Conference of Computational Mechanics, Siracusa 22-24 settembre 2010, Castello Maniace.
- 2010 IV Convegno Monitoraggio e Conservazione Preventiva dei Beni Culturali. Università degli Studi di Cassino, 27-29 maggio 2010.
- 2009 MuRiCo3, Mechanics of Masonry Structures Strengthened with Composite Materials: modeling, testing, design, control. Palazzo Badoer Venezia (Italy), April 22-24, 2009.
- 2008 WCCM 8, 8th. World Congress on Computational Mechanics. Lido Island in Venice (Italy) on 30 June - 4 July 2008
- 2008 XVII Italian Conference of Computational Mechanics, Alghero 10-12 settembre 2008, Facoltà di Architettura.
- 2007 XVIII National Conference of the Italian Association of Theoretical and Applied Mechanics, 11–14 Settembre 2007

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- 2014-17 Member of the Steering Committee of the Italian Association of Theoretical and Applied Mechanics AIMETA
- 2009-13 Member of the National Secretariat of the Scientific Disciplinary Sector ICAR/08 “Scienza delle Costruzioni”
- 2007-13 Member of the General Council IACM (International Association of Computational Mechanics)
- 2001-16 Member of the “Laboratoire Lagrange/Laboratorio Lagrange” Italo-Francese
- 2000-05 Member of the Steering Committee of the Italian Group of Computational Mechanics GIMC-AIMETA
- 1990- Member of the Italian Group of Computational Mechanics GIMC-AIMETA

MEMBER OF EDITORIAL ADVISORY BOARD OF INTERNATIONAL JOURNALS

- 2018- International Journal of Mathematical Physics
- 2018- Frattura ed Integrità Strutturale (Fracture and Structural Integrity)
- 2015- International Journal of Masonry Research and Innovation IJMRI
- 2013- European Journal of Computational Mechanics/Revue Européenne de Mécanique Numérique
- 2012-16 Journal of Structures
- 2011- **Associate Editor di Meccanica**
- 2009- Annals of Solid and Structural Mechanics
- 2005- International Journal for Computational Methods in Engineering Science and Mechanics

INSTITUTIONAL RESPONSABILITY

- 2019- Deputy Head of the Department of Structures for Engineering and Architecture, University of Naples “Federico II”
- 2019- Member of the PhD College of Ingegneria strutturale, geotecnica e rischio sismico, University of University of Naples “Federico II”
- 2016 Member of the Evaluation Team Group GEV appointed by ANVUR for Area 08b VQR 2011-2014
- 2015- Member of the **Evaluation Team** for the University of Cassino and Southern Lazio
- 2013- **Dean of the PhD College** of Civil Engineering, Mechanics and Biomechanics, University of Cassino and Southern Lazio
- 2013-15 **President of the Teachers-Students Joint Committee**, Department of Civil and Mechanical Engineering, University of Cassino and Southern Lazio
- 2012- Deputy Head of the Department of Civil and Mechanical Engineering dell’University of Cassino and Southern Lazio
- 2009-12 Member of the **Academic Senate**, University of Cassino and Southern Lazio
- 2005-12 **Head of the Department** of Mechanics, Structures and Environment, University of Cassino and Southern Lazio
- 2005-13 Member of the PhD College of Civil Engineering of the University of Cassino and Southern Lazio
- 2000-04 **Dean of the PhD College** of Civil Engineering, Mechanics and Biomechanics, University of Cassino and Southern Lazio
- 1999-05 **Dean of the bachelor and master College of Civil Engineering**, University of Cassino and Southern Lazio

RESEARCH GRANTS ON COMPETITIVE CALLS (FROM 2000)

- 2019-21 “Technological innovation in earthquake engineering” founded by ReLUIS (Network of University Laboratories of Seismic Engineering) Department of Civil Protection, title of the research “Modeling of strengthening interventions” local unit leader
- 2017-20 “Multi-scale mechanical models for the design and optimization of micro-structured smart materials and metamaterials”, funded by MIUR/PRIN (Italian Ministry of Education Research Program); local unit leader.
- 2014-18 “Technological innovation in earthquake engineering” founded by ReLUIS (Network of University Laboratories of Seismic Engineering) Department of Civil Protection, title of the research “Modeling of strengthening interventions” local unit leader
- 2011-13 “Multi-scale modelling of materials and structures”, funded by MIUR/PRIN (Italian Ministry of Education Research Program), title of the research: Multiscale modelling of devices and structural elements in composites with shape memory alloys inclusions, local unit leader.
- 2009-13 “Technological innovation in earthquake engineering” founded by ReLUIS (Network of University Laboratories of Seismic Engineering) Department of Civil Protection,

title of the research “Analysis and development of new materials for the seismic” local unit leader

2005-08 “Technological innovation in earthquake engineering” founded by ReLUIS (Network of University Laboratories of Seismic Engineering) Department of Civil Protection, title of the research “Analysis of the behavior of masonry structures strengthened with composite materials” local unit leader

2004-05 “Micro-Structural Problems and Models: Applications in Structural and Civil Engineering”, funded by MIUR/PRIN (Italian Ministry of Education Research Program), title of the research: Shape-Memory Alloy Composites: Modeling and Computational Procedures for Structural Engineering Applications, local unit leader.

2000-03 “Diagnosis and protection of architectural structures with particular reference to the effects of earthquakes and other natural disasters”, funded by CNR (National Research Council Program), title of the research: Modeling and analysis of masonry structures; local unit leader.

2007- FAR University Funds for Research: Maximum Grant *

* the Research Funds at the Department of Civil and Mechanical Engineers are distributed based on the evaluation of the research