

C U R R I C U L U M V I T A E

M I C H E L E B R U N

Last update: 20/04/2023

Full Professor of  
Solid and Structural Mechanics  
Dipartimento di Ingegneria Meccanica,  
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Università di Cagliari  
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Nationality: Italian

Date of Birth: 22<sup>nd</sup> July 1972

Place of Birth: Cremona – ITALY

FORMATION	
02/2003	PhD in Solid and Structural Mechanics, Università di Trento
06/1999	MsC in Structural Civil Engineering. (110/110), Università di Brescia

POSITIONS	
02/2022 – Today	Full Professor of Solid and Structural Mechanics, Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università di Cagliari
12/2014 – 01/2022	Associate Professor of Solid and Structural Mechanics, Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università di Cagliari
01-02/2019 06-08/2019	Research Scientist at Laboratoire d’Acoustique de l’Université du Mans (Francia). Giovani Ricercatori Fellowship
03/2018	Research Scientist at Laboratoire d’Acoustique de l’Université du Mans. HUB Acoustique project Fellowship
02/2017	Research Scientist at Department of Mechanical Engineering, Amirkabir University of Technology, Tehran Polytechnique (Iran). Marhaba Fellowship
08/2012- 08/2014	Marie Curie Fellow, Department of Mathematical Sciences, University of Liverpool (Regno Unito).
06/2011 01/2010 01/2009	Research Associate. RCMM Fellowship, Department of Mathematical Sciences, University of Liverpool.
06/2008 – 09/2008	Research Associate. EPSRC Fellowship: “Computational differential geometry applied to invisibility cloaks in electromagnetism and elastodynamics” Department of Mathematical Sciences, University of Liverpool
10/2006 – 12/2014	Assistant Professor of Solid and Structural Mechanics. Dipartimento di Ingegneria Strutturale, Università di Cagliari.
10/2005 – 09/2006	Post Doc Research Associate ParisTech Fellowship: “Modélisation des effets du vieillissement sur les propriétés des

	élastomères chargés” in collaborazione con Electricité de France Laboratoire des Mécanique des Solides, Ecole Polytechnique, Palaiseau.
10/2004 – 09/2005	Post Doc Research Associate Egide Fellowship: “ Multiscale modeling of nanostructured triblock copolymers ” Laboratoire des Mécanique des Solides, Ecole Polytechnique, Palaiseau.
03/2003 – 09/2004	Borsista Post Doc Dipartimento di Ingegneria Meccanica e Strutturale, Università di Trento.
09/2003 – 12/2003	Visiting Scientist Dept of Mechanical Engineering, University of Colorado at Boulder, CO (USA).
11/2002 – 12/2002	Contrattista di Ricerca: “Sviluppo di interfaccia BEM/FEM con GID”. Dipartimento di Ingegneria Meccanica e Strutturale, Università di Trento.

**PUBLICATIONS** (<http://people.unica.it/brunmi/publications/>)

Author of more than 70 publications in international journals (in the majority in the most prestigious journals of the mechanics of materials and Structures), several book chapters and conference proceedings

**ResearcherID:** J-3406-2012

**Scopus Author ID:** 7005662802

**ORCID:** 0000-0002-4760-9062

Citations (20<sup>th</sup> April 2023): Scopus 1611, Google Scholar 2103

H-index (20<sup>th</sup> April 2023): Scopus 21, Google Scholar 23

Internazionale peer reviewed journals	<ol style="list-style-type: none"> <li>1. Brun, M., Guenneau, S., 2023 “Transformation design of in-plane elastic cylindrical cloaks, concentrators and lenses”. 119, 103124. doi: 10.1016/j.wavemoti.2023.103124</li> <li>2. Carta, G., Nieves, M.J., Brun, M., 2022 “Lamb waves in discrete homogeneous and heterogeneous systems: Dispersion properties, asymptotics and non-symmetric wave propagation”, <i>Eur J Mech A Solids</i>, 104695, in press. doi: 10.1016/j.euromechsol.2022.104695</li> <li>3. Moradweysi, P., Santucci, P.M., Carta, G., Goudarzi, T., Aghdam, M.M., Baldi, A., Brun, M., 2022 “Design and analysis of a thick Miura-ori folded structure with large negative Poisson’s ratio”, <i>Mech. Adv. Mater. Struct.</i>, in press. doi: 10.1080/15376494.2022.2126567</li> <li>4. Rakhimzhanova, A., Brun, M. 2022 “Direction-selective non-reciprocal mechanical energy splitter”, <i>Philos. Trans. R. Soc., A</i>, <b>380</b>, 20210372. doi: /10.1098/rsta.2021.0372</li> <li>5. Sulis, S., Rakhimzhanova, A., Brun, M., 2022 “Filtering Properties of Discrete and Continuous Elastic Systems in Series and Parallel”, <i>Appl. Sci.</i>, <b>12</b>(8), 3832. doi: 10.3390/app12083832.</li> <li>6. Baldi, A., Brun, M., Carta, G. 2022 “Three-dimensional auxetic porous medium”, <i>Mech. Mat.</i>, <b>164</b>, 104114. doi: 10.1016/j.mechmat.2021.104114.</li> <li>7. Morvaridi, M., Carta, G., Bosia, F., Gliozzi, A.S., Pugno, N.M., Misseroni, D., Brun, M. 2021 “Hierarchical auxetic and isotropic porous medium with extremely negative Poisson’s ratio”, <i>Extreme Mech. Lett.</i>, <b>48</b>, 101405. doi: 10.1016/j.eml.2021.101405.</li> <li>8. Nieves, M.J., Carta, G., Pagneux, V., Brun, M. 2021 “Directional control of Rayleigh</li> </ol>
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wave propagation in an elastic lattice by gyroscopic effects”, *Front. Mat.*, **7**, 602960. doi: 10.3389/fmats.2020.602960

9. Nieves, M.J., Carta, G., Pagneux, V., Brun, M. 2020 “Rayleigh waves in micro-structured elastic systems: Non-reciprocity and energy symmetry breaking”, *Int. J. Eng. Sci.*, **156**, 103365. doi: 10.1016/j.ijengsci.2020.103365
10. Casnedi, L., Licheri, R., Brun, M., Pia, G. 2020 “From nature geometry to material design: Advan05 Gennaio 2021ced fractal nature analysis for predicting experimental elastic properties”, *Ceram. Int.*, **46**, 15, 23947-23955. doi: 10.1016/j.ceramint.2020.06.171
11. Meirbekova, B., Brun, M. 2020 “Control of elastic shear waves by periodic geometric transformation: cloaking, high reflectivity and anomalous resonances”, *J. Mech. Phys. Solids*, **137**, 103816. doi: 10.1016/j.jmps.2019.103816
12. Meirbekova, B., Brun, M., Pagneux, V. 2020 “Time-harmonic dynamics of curved beams”, *Lectures Notes in Mechanical Engineering*, **475**(2232), 468. doi: 10.1007/978-3-030-41057-5\_52
13. Cabras, L., Brun, M., Misseroni, D. 2019 “Micro-structured medium with large isotropic negative thermal expansion”, *Proc. R. Soc. Lond. A*, **475**, 20190468. doi: 10.1098/rspa.2019.0468  
(i) Issue Cover: <https://royalsocietypublishing.org/doi/10.1098/rspa.2019.0468>,  
(ii) <https://www.rainews.it/tgr/sardegna/notiziari/index.html?/tgr/video/2020/01/ContentItem-b29b68ef-0d4a-4229-9f5a-e9003644b862.html>, min 18:05,  
(iii) [https://www.unica.it/unica/page/it/oggetti\\_caldi\\_o\\_freddi\\_una\\_questione\\_di\\_geometria?contentId=NTZ206232](https://www.unica.it/unica/page/it/oggetti_caldi_o_freddi_una_questione_di_geometria?contentId=NTZ206232)
14. Nieves, M.J., Brun, M. 2019 “Dynamic characterization of a periodic microstructured flexural systems with rotational inertia”, *Phil. Trans. R. Soc. Lond.*, Theme issue ‘Modelling of dynamic phenomena and localization in structured media (part 1)’ **377**, 20190116. doi: 10.1098/rsta.2019.0113
15. Garau, M., Nieves, M.J., Carta, G., Brun, M. 2019 “Transient response of a gyro-elastic structured medium: unidirectional waveforms and cloaking”, *Int. J. Eng. Sci.*, **143**, 115-141. doi: 10.1016/j.ijengsci.2019.05.007
16. Morvaridi, M., Carta, G., Brun, M. 2018 “Platonic crystal with low-frequency locally-resonant spiral structures: wave trapping, transmission amplification, shielding and edge waves”, *J. Mech. Phys. Solids* **121**, 496-516. doi: 10.1016/j.jmps.2018.08.017
17. Brun, M., Casnedi, L., Pia, G. 2018 “Bending strength of porous ceramics tiles: Bounds and estimates of effective properties of an Intermingled Fractal Units’ model”, *Ceram. Int.*, **44**(9), 10241-10248. doi: j.ceramint.2018.03.028
18. Morvaridi, M., Brun, M. 2018 “Perfectly Matched Layers for flexural waves in Kirchhoff-Love plates”, *Int. J. Sols. Struct.*, **134**, 293-303. doi: 10.1016/j.ijsolstr.2017.11.009
19. Carta, G., Giaccu, G.F., Brun, M. 2017 “A phononic band gap model for long bridges. The ‘Brabau’ bridge case”, *Eng. Struct.*, **140**, 66-76. doi: 10.1016/j.engstruct.2017.01.064
20. Pia, G., Brun, M., Aymerich, F., Delogu, F. 2017 “Gyroidal structures as approximants to nanoporous metal foams: Clues from mechanical properties”, *J. Mater. Sci.*, **52**, 1106-1122. doi: 10.1007/s10853-016-0407-5
21. Morvaridi, M., Brun, M. 2016 “Perfectly Matched Layers for flexural waves: an exact

- analytical model”, *Int. J. Sols. Struct.*, **102-103**, 1-9. doi: 10.1016/j.ijsolstr.2016.10.024
22. Trevisan, A., Borzi, G.P., Movchan, N.V., Movchan, A.B., Brun, M. 2016 “Thermal shock driven fracture in a structured solid: dynamic crack growth and nucleation”, *Int. J. Fract.*, **202**, 167-177. doi: 10.1007/s10704-016-0118-6
  23. Cabras, L., Brun, M. 2016 “A class of auxetic three-dimensional lattices”, *J. Mech. Phys. Solids*, **91**, 56-72. doi: 10.1016/j.jmps.2016.02.010
  24. Carta, G., Brun, M., Baldi, A. 2016 “Design of a porous material with isotropic negative Poisson’s ratio”, *Mech. Mat.*, **97**, 67-75. doi: 10.1016/j.mechmat.2016.02.012
  25. Carta, G., Cabras, L., Brun, M. 2016 “Continuous and discrete microstructured materials with null Poisson’s ratio”, *J. Eur. Ceram. Soc.*, **36**(9), 2183-2192. doi: 10.1016/j.jeurceramsoc.2016.01.003
  26. Carta, G., Brun, M., Movchan, A.B., Boiko, T. 2016 “Transmission and localisation in ordered and randomly-perturbed structured flexural systems”, *Int. J. Eng. Sci.*, **98**, 126-152. doi: 10.1016/j.ijengsci.2015.09.005
  27. Jones, I.S., Brun, M., Movchan, N.V., Movchan, A.B. 2015 “Singular perturbations and cloaking illusions for elastic waves in membranes and Kirchhoff plates”, *Int. J. Sols. Struct.*, **69-70**, 498-506. doi: 10.1016/j.ijsolstr.2015.05.001
  28. Carta, G., Brun, M. 2015 “Bloch-Floquet waves in flexural systems with continuous and discrete elements”, *Mech. Mat.*, **87**, 11-26. doi: 10.1016/j.mechmat.2015.03.004
  29. McPhedran, R.C., Movchan, A.B., Movchan, N.V., Brun, M., Smith, M.J.A. 2015 “Parabolic’ trapped modes and steered Dirac cones in platonic crystals” *Proc. R. Soc. Lond. A*, **471**, 20140746. doi: 10.1098/rspa.2014.0746
  30. Movchan, A.B., Brun, M., Slepyan, L.I., Giaccu, G.F. 2015 “Dynamic multi-structure in modelling a transition flexural wave” *Mathematika*, **61**(2), 444-456. doi: 10.1112/S0025579314000321
  31. Cabras, L., Brun, M. 2014 “Auxetic two-dimensional lattices with Poisson’s ratio arbitrarily close to -1” *Proc. R. Soc. Lond. A*, **470**, 20140538. doi: 10.1098/rspa.2014.0538
  32. Brun, M., Colquitt, D., Jones, I.S., Movchan, A.B., Movchan, N.V. 2014 “Transformation cloaking and radial approximations for flexural waves in elastic plates” *New J. Phys.*, **16**, 093020. doi: 10.1088/1367-2630/16/9/093020
  33. Brun, M., Giaccu, G.F., Movchan, A.B., Slepyan, L.I. 2014 “Transition wave in the collapse of the San Saba bridge” *Front. Mater.*, **1**:12. doi: 10.3389/fmats.2014.00012
  34. Colquitt, D., Brun, M., Gei, M., Movchan, A.B., Movchan, N.V., Jones, I.S. 2014 “Transformation elastodynamics and cloaking for flexural waves” *J. Mech. Phys. Solids*, **72**, 131-143. doi: 10.1016/j.jmps.2014.07.014
  35. Carta, G., Brun, M., Movchan, A.B. 2014 “Elastic wave propagation and stop-band generation in strongly damaged solids” *Fract. Struct. Integrity*, **29**, 28-36. doi: 10.3221/IGF-ESIS.29.04
  36. Cabras, L., Brun, M. 2014 “Effective properties of a new auxetic triangular lattice: an analytical approach” *Fract. Struct. Integrity*, **29**, 9-18. doi: 10.3221/IGF-ESIS.29.02
  37. Carta, G., Brun, M., Movchan, A.B. 2014 “Dynamic response and localisation in strongly damaged waveguides” *Proc. R. Soc. Lond. A*, **470**, 2167, 20140136. doi: 10.1098/rspa.2014.0136
  38. Carta, G., Brun, M., Movchan, A.B., Movchan, N.V., Jones, I.S. 2014 “Dispersion

properties of vortex-type monatomic lattices” *Int. J. Sols. Struct.*, **51**, 11-12, 2213–2225. doi: 10.1016/j.ijsolstr.2014.02.026

39. *Bigoni, D., Guenneau, S., Movchan, A.B., Brun, M.* 2013 “Elastic metamaterials with inertial locally resonant structures: Application to lensing and localization” *Phys. Rev. B*, **87**, 174303. doi: 10.1103/PhysRevB.87.174303
40. *Colquitt, D.J., Jones, I.S., Movchan, N.V., Movchan, A.B., Brun, M., McPhedran, R.C.* 2013 “Making Waves Round a Structured Cloak: Lattices, Negative Refraction and Fringes” *Proc. R. Soc. Lond. A*, **469**, 2157, 20130218. doi: 10.1098/rspa.2013.0218. **Top 2013 downloaded article from 2013**
41. *Brun, M., Movchan, A.B., Slepyan, L.I.* 2013 “Transition wave in a supported heavy beam” *J. Mech. Phys. Solids*, **61**, 10, 2067–2085. doi: 10.1016/j.jmps.2013.05.004
42. *Brun, M., Movchan, A.B., Jones, I.S., McPhedran, R.C.* 2013 “Bypassing shake, rattle and roll” *Phys. World*, **26**, 5, 32-36.
43. *Carta, G., Jones, I.S., Brun, M., Movchan, N.V., Movchan, A.B.* 2013 “Crack propagation induced by thermal shocks in structured media” *Int. J. Sols. Struct.*, **50**, 18, 2725-2736. doi: 10.1016/j.ijsolstr.2013.05.001
44. *Brun, M., Movchan, A.B., Jones, I.S.* 2013 **Special Issue on Dynamics of Phononic Materials and Structures** “Phononic Band Gap Systems in Structural Mechanics: Finite Slender Elastic Structures and Infinite Periodic Waveguides” *J. Vib. Acous.*, **135**(4), 041013. doi:10.1115/1.4023819
45. *Buryachenko, V., Brun, M.* 2013 “Iteration method in linear elasticity of random structure composites containing heterogeneities of noncanonical shape” *Int. J. Sols. Struct.*, **50**, 7-8, 1130-1140. doi: 10.1016/j.ijsolstr.2012.12.018
46. *Slepyan, L., Brun, M.* 2012 “Driving forces in moving-contact problems of dynamics elasticity: indentation, wedging and free-sliding” *J. Mech. Phys. Solids*, **60**, 11, 1883-1996. doi: 10.1016/j.jmps.2012.06.011
47. *Brun, M., Jones, I.S., Movchan, A.B.* 2012 “Vortex-type elastic structured media and dynamics shielding” *Proc. R. Soc. Lond. A*, **468**, 2146, 3027-3046. doi: 10.1098/rspa.2012.0165
48. *Buryachenko, V., Brun, M.* 2012 “Thermoelastic effective properties and stress concentrator factors of composites reinforced by heterogeneities of noncanonical shape” *Mech. Mat.*, **53**, 91-110. doi: 10.1016/j.mechmat.2012.05.005
49. *Buryachenko, V., Brun, M.* 2012 “Random Residual Stresses in Elasticity Homogeneous Medium with Inclusions of Noncanonical Shape” *Int. J. Multiscale Comp. Engrg.*, **10**, 3, 261-279. doi: 10.1615/IntJMultCompEng.2012002565
50. *Carta, G., Brun, M.* 2012 “A Dispersive Homogenization Model Based on Lattice Approximation for the Prediction of Wave Motion in Laminates” *J. Appl. Mech.*, **79**, 021019. doi: 10.1115/1.4005579
51. *Brun, M., Giaccu, G.F., Movchan, A.B., Movchan, N.V.* 2012 “Asymptotics of eigenfrequencies in the dynamic response of elongated multi-structures” *Proc. R. Soc. Lond. A*, **468**, 2138, 378-394. doi: 10.1098/rspa.2011.0415
52. *Giordano, S., Palla, P.L., Cadelano, E., Brun, M.* 2012 “Elastic behaviour of inhomogeneities with size and shape different from their hosting cavities” *Mech. Mat.*, **44**, 4-22. doi: 10.1016/j.mechmat.2011.07.015

	<p>53. <i>Buryachenko, V., Brun, M.</i> 2011 “FEA in elasticity of random structure composites reinforced by heterogeneities of non canonical shape” <i>Int. J. Sols Struct.</i> <b>48</b>, 5, 719-728. doi:10.1016/j.ijsolstr.2010.11.009</p> <p>54. <i>Brun, M., Movchan, A.B., Movchan, N.V.</i> 2010 “Shear Polarization of Elastic Waves via Structured Interface” <i>Continuum Mech. Thermodyan.</i> <b>22</b>, 6-8, 663-677. doi: 10.1007/s00161-010-0143-z</p> <p>55. <i>Brun, M., Guenneau, S., Movchan, A.B., Bigoni, D.</i> 2010 “Dynamics of structural interfaces: filtering and focussing effects for elastic waves” <i>J. Mech. Phys. Solids</i> <b>59</b>, 9, 1212-1224. doi: 10.1016/j.jmps.2010.06.008</p> <p>56. <i>Brun, M., Gunneau, S., Movchan, A.B.</i> 2009 “Achieving control of in-plane elastic waves” <i>Appl. Phys Lett.</i> <b>94</b>, 061903. doi: 10.1063/1.3068491</p> <p>57. <i>Brun, M., Lopez-Pamies, O., Ponte Castañeda, P.</i> 2007 “Homogenization estimates for fiber-reinforced elastomers with periodic microstructures”. <i>Int. J. Sols Struct.</i> <b>44</b>, 5953-5979. doi: 10.1016/j.ijsolstr.2007.02.003</p> <p>58. <i>Capuani, D., Bigoni, D. and Brun, M.</i> 2005 “Integral representation at the boundary for Stokes flow and symmetric Galerkin formulation”. <i>Arch. Mech.</i> <b>57(5)</b>, 363-385.</p> <p>59. <i>Bertoldi, K., Brun, M. and Bigoni, D.</i> 2005 “A new boundary element technique without domain integrals for elastoplastic solids”. <i>Int. J. Num. Meth. Engrg.</i> <b>64</b>, 877-906. doi: 10.1002/nme.1385</p> <p>60. <i>Brun, M., Bigoni, D. and Capuani, D.</i>, 2003. “A boundary element technique for incremental elasticity. Part II: bifurcations and shear bands”. <i>Comput. Mech. Appl. Mech. Engrg.</i> <b>192</b>, 2481-2499. doi: 10.1016/S0045-7825(03)00272-X</p> <p>61. <i>Brun, M., Capuani, D. and Bigoni, D.</i>, 2003. “A boundary element technique for incremental elasticity. Part I: formulation”. <i>Comput. Meth. Appl. Mech. Engrg.</i> <b>192</b>, 2461-2479. doi: 10.1016/S0045-7825(03)00268-8</p> <p>62. <i>Brun, M., Carini, A. and Genna, F.</i>, 2001. “On the construction of extended problems and related functionals for general nonlinear equations”. <i>J. Mech. Phys. Solids</i> <b>49</b>, 839-856. doi: 10.1016/S0022-5096(00)00051-X</p>
PhD Thesis	<p>1. <i>Brun, M.</i>, 2003. “Boundary elements in finite elasticity”. <i>PhD Thesis</i>. University of Trento.</p>
Books	<p>1. <i>Movchan, N.V., Movchan, A.B., McPhedran, R.C., Brun, M., Jones, I.S.</i> 2016. “Metamaterial Systems and Routing of Elastic Waves in Engineered Structures”, 107-113, in Aston, P.J., Mulholland, A.J., Tant, K.M.M. “UK Success Stories in Industrial Mathematics”, Springer International Publishing Switzerland. ISBN 978-3-319-25454-8 ISBN: 978-3-7091-1308-0 (Print) 978-3-7091-1309-7 (Online)</p> <p>2. <i>Movchan, A.B., Brun, M., Movchan, N.V.</i> 2012. “Waves and Defect Modes in structured Media” in Romeo, F., Ruzzene, M. “Wave Propagation in Linear and Nonlinear Periodic Media – Analysis and Application”, CISM Course and Lectures, vol. 540, Springer Wien New York. ISBN: 978-3-7091-1308-0 (Print) 978-3-7091-1309-7 (Online)</p> <p>3. <i>Brun, M., Bigoni, D. and Capuani, D.</i>, 2002. “Boundary elements and shear bands in incremental elasticity”. IUTAM Symposium 02/4, Asymptotics, Singularities and Homogenisation in Problems of Mechanics, Liverpool, UK, 8-11 July 2002, Kluwer, Netherlands</p>

<u>RESEARCH PROJECTS</u>	
2019-2021	Fondazione Sardegna – bando RAS ricerca di base 2018: ADVAnced Nanoporous materials for Cutting edge engineering (ADVANCING) (k€ 55). Project Coordinator
2017-2019	H2020-MSCA-IF-2016: 747334 CAT-FLAPP. Catastrophic Failure in Flexural Lattice Problems (k€ 179). Project Coordinator
2012-2104	FP7-PEOPLE-2011-IEF: 302357 DYNAMETA. Controlling elastic waves: structured media and metamaterials in the mechanics of solids and structures. (k€ 280). Principal Researcher
2013	Research Team Pump Primig 2013, University of Liverpool (k€ 5)
2012	Premialità. Università di Cagliari, Italy (k€ 10)
2012-2015	Progetto ricerca di base Regione Autonoma della Sardegna 2010: “Modellazione Multiscala della Meccanica dei Materiali Complessi (M4)”. Coordinatore unità Università di Cagliari (k€ 108).
2009-2011	Progetto ricerca di base Regione Autonoma della Sardegna 2008: “Modellazione Multiscala della Meccanica dei Materiali Compositi (M4C)”. Coordinatore unità Università di Cagliari (k€ 62).
2007	Fondo per il sostegno della ricerca di base e per lo start-up dei giovani Ricercatori 2007: “Invisibilità alle onde elastiche. Studio di un metamateriale capace di rendere invisibile un’inclusione” – Università di Cagliari. (k€ 11).
2018	Programma Mobilità Giovani Ricercatori (6.4 k€)
2016	Erasmus Mundus – MARHABA (2.5 k€)
2008-2017	Visiting Professor sponsor. 2020/2021: Prof. Oleg Kirillov, Prof. Chiara Daraio 2019: Prof. Oleg Kirillov, 2016: Prof. Vincent Pagneux (k€ 3.8), Prof. Oleg Kirillov (k€ 3.8) 2015: Prof. L. Slepyan (k€ 21.7) 2011: Prof. L. Slepyan (k€ 36), Prof. A.B. Movchan (k€ 7.2) 2010: Prof. A.B. Movchan (k€ 7.1), Dr. V. Buryachenko (k€ 16.7) 2009: Dr. V. Buryachenko (k€ 63), Prof. A.B. Movchan (k€ 9) 2008: Prof. A.B. Movchan (k€ 3.5)  Visiting Scientist sponsor. 2013: Prof. G. Mishuris, Prof. L. Slepyan

<u>TEACHING</u>	
2023	Advanced Theory of Structures (Mechanical Engineering), University of Cagliari (6 credits).
2014/2023	Solid and Structural Mechanics (Environmental Engineering), University of Cagliari (8 credits).
2014/2023	Solid and Structural Mechanics (Chemical Engineering), University of Cagliari (6 credits).
2018/2021	Advanced Solid Mechanics 2 (Civil Engineering), Università di Cagliari (6 credits).

2016/2018	Safety and Reliability of Structures (Civil Engineering), University of Cagliari (6 credits).
2016	PhD Course “Waves in discrete and structural elements” Amirkabir University of Technology, Iran (10 ore). Erasmus mundus MARHABA project.
2016	PhD Course “Waves in discrete and structural elements” Weimar University, Germania (10 ore). Mosta mobility program.
2011/2012 2014/2016	Advanced Solid Mechanics 2 (Civil Engineering), University of Cagliari (6 credits).
2007/2010	Safety and Reliability of Structures 1 (Civil Engineering), University of Cagliari (6 credits).
2007/2010	Safety and Reliability of Structures 2, (Civil Engineering) University of Cagliari (6 credits).
2006/2007	Solid and Structural Mechanics (Building Engineering), University of Cagliari (10 credits).
2003/2004	Teaching Assistant in Solid and Structural Mechanics, Prof. D. Bigoni, Prof. G. Novati, University of Trento. Teaching Assistant in Solid and Structural Mechanics, Prof. A. Cazzani, University of Mantova (Milan Polytechnic).
2002/2003	Teaching Assistant in Solid and Structural Mechanics, Prof. D. Bigoni, Prof. G. Novati, University of Trento. Teaching Assistant in Structural Mechanics, Prof. M. Rovati, University of Trento. Teaching Assistant in Solid and Structural Mechanics, Prof. A. Cazzani, University of Mantova (Milan Polytechnic).
2001/2002	Teaching Assistant in Solid and Structural Mechanics, Prof. A. Cazzani, University of Mantova (Milan Polytechnic).

#### SCIENTIFIC ACTIVITY

Referee	<ul style="list-style-type: none"> <li>▪ <b>Journals:</b> Proceedings of the Royal Society A, Journal of the Mechanics and Physics of Solids, Mechanics of Materials, International Journal of Solids and Structures, International Journal of Engineering Science, Computer Methods in Applied Mechanics and Engineering, Continuum Mechanics and Thermodynamics, Acta Mechanica Sinica, International Journal of Fracture, Composite Structures, Journal of Applied Physics, Mechanics Research Communications, Wave Motion, Journal of Mechanics of Materials and Solids, Multiscale Modeling and Simulation (MMS) journal SIAM, Meccanica, Journal of Vibration and Acoustics, Journal of Elasticity, Mathematical Methods in Applied Sciences, Engineering Analysis with Boundary Elements, European Journal of Mechanics A, Engineering Structures, Journal of Building Engineering, Crystals, Acta Acustica, Quarterly Journal of Mechanics and Applied Mathematics, Journal of Reinforced Plastics and Composites, International Journal of Non-Linear Mechanics, Smart Materials and</li> </ul>
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	<p>Structures, IMA Journal of Applied Mathematics, Structures, Composite Structures, Journal of Physics: Condensed Matter, Mechanical Systems and Signal Processing, New Journal of Physics, Journal of Sound and Vibration, Advanced Engineering Materials, the Journal of the Acoustical Society of America, Scientific Reports, Extreme Mechanics Letters, Nature.</p> <ul style="list-style-type: none"> <li>▪ <b>Projects:</b> European Research Council Starting Grants. Research Grants Council (RGC) of Hong Kong.</li> </ul>
Editorial Board	Mathematical Problems in Engineering (from 2015), the Scientific World Journal (2013-2016)
Conferences	<p>Invited lecturer at the summer School “Wave propagation in complex and microstructured media” Cargèse, Corsica, 20-30 August, 2019  <a href="https://pmmh.spip.espci.fr/?page=art-ss-menu&amp;id_article=473">https://pmmh.spip.espci.fr/?page=art-ss-menu&amp;id_article=473</a></p> <p>Mini symposium organizer “New Concepts for Advanced Materials and Structures” 10th European Solid Mechanics Conference, Bologna, 2018  <a href="http://www.esmc2018.org/drupal8/ms-display-public">http://www.esmc2018.org/drupal8/ms-display-public</a></p> <p>Partecipation at more than 60 Conferences and workshops, more than 35 as invited speaker (ESMC 2022, Metamaterials 2022, Euromech Colloquium 616 on MEMS and METAMATERIALS 2022, ICTAM 2020+1, Metamaterials 2019, Dynamic phenomena in media with microstructure, NanomaterialsTrends - Hybrid nanocomposites and nanogranular materials, ESMC 2018, Advances in Mechanical Metamaterials, DCEE 2017, Cermodel, SES, BAMC, AIMETA, GIMC-GMA, CMDS, CDR, ...).</p>
Invited Seminars	Harvard University (USA), Imperial College (UK), University of Colorado at Boulder (USA), École Polytechnique (F), ENSAM (F), Loughborough University (UK), University of Liverpool (UK), Università di Brescia (I), Politecnico di Milano (I), Amirkabir University of Technology (Iran), Università di Napoli Federico II (I), Laboratoire d'Acoustique de l'Université du Maine (Le Mans, Francia), Università di Parma (I), Politecnico di Torino (I).
Associations	SLACS Istituto officina dei Materiali, CNR-INFM (2009-2012), ISIMM International Society for the Interaction of Mechanics and Mathematics (dal 2012). GNFM Gruppo Nazionale di Fisica Matematica (2017)
Supervision	2 postdoc, 5 PhDs, 19 MsC, 3 BsC
Commissions	Tenure evaluation of M. Taylor (Santa Clara University), PhD committe per E. Algehyne Viva (University of Strathclide), controrelatore 3 tesi magistrale (Università di Brescia e di Cagliari), Best PhD Thesis (AIMETA)
Dissemination	Intervista Telegiornale Rai Regionale (2020), intervista Radio3 Scienza (2007), <a href="#">Science News</a> , <a href="#">Physics World</a> , <a href="#">Science Daily a</a> , <a href="#">New Scientist</a> , <a href="#">Science 2.0</a> blog, <a href="#">Science Daily b</a>
Collaborations	Prof. Alexander B. Movchan (University of Liverpool, UK), Prof. Pedro Ponte-Castañeda (University of Pennsylvania, USA), Prof. Leonid Slepyan (Tel Aviv University, Israel), Prof. Ross McPhedran (University of Sidney, Australia), Prof.

	<p>Sebastien Guenneau (DR2, Institut Fresnel, UMR CNRS 6133, Marseille, France), Prof. Oscar Lopez-Pamies (University of Illinois at Urbana-Champaign, USA), Prof. Katia Bertoldi (Harvard University, USA), Prof. Antonio Baldi (Università di Cagliari), Prof. Francesco Delogu (Università di Cagliari), Prof. Francesco Aymerich (Università di Cagliari), Dr. Giorgio Pia (Università di Cagliari), Prof. Roberta Licheri (Università di Cagliari), Dr. Giorgio Carta (Università di Cagliari), Prof. Roberto Orrù (Università di Cagliari), Prof. Giacomo Cao (Università di Cagliari), Prof. Antonio Locci (Università di Cagliari), Prof. Alberto Cincotti (Università di Cagliari), Prof. Maria Francesca Casula (Università di Cagliari), Prof. Claudio Melis (Università di Cagliari), Prof. Davide Bigoni (Università di Trento), Prof. Natasha V. Movchan (University of Liverpool, UK), Dr. Daniel Colquitt (University of Liverpool, UK), Dr. Domenico Capuani, (Università di Ferrara), Prof. Luciano Colombo (Università di Cagliari), Dr. Stefano Giordano (Institute d'Electronique, de Microélectronique, et de Nanotechnology (IEMN) – CNRS, Lille, France), Prof. Valeriy Buryachenko (IllinoisRocstar Dayton, OHIO, USA), Prof. Ian S. Jones (Liverpool John Moores University, UK), Prof. Massimiliano Zingales (Università di Palermo), Dr. Gian Felice Giaccu (Università di Sassari), Prof. Massimiliano Fraldi (Università di Napoli Federico II), Prof. Giovanni Noselli (SISSA, International School for Advanced Studies, Trieste), Prof. Diego Misseroni (Università di Trento), Prof. Nicola Pugno (Università di Trento), Dr. Taha Goudarzi (Amirkabir University of Technology, Iran), Dr. Hamid Naderan (Amirkabir University of Technology, Iran), Dr. Domenico Tallarico (EMPA, Switzerland), Prof. Vincent Pagneux (DR2, Laboratoire d'Acoustique de l'Université du Main, France), Prof. Oleg Kirillov (Department of Mathematics, Physics and Electrical Engineering, Northumbria University, UK), Prof. Federico Bosia (Politecnico di Torino), Prof. Antonio Gliozzi (Politecnico di Torino)</p>
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<b>INSTITUTIONAL ACTIVITY</b>	
Academic (Università di Cagliari)	Collegio di Dottorato in Ingegneria Civile ed Architettura (dal 2014), Collegio di Dottorato in Ingegneria Strutturale (2010-2014), Giunta di Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali (dal 2014), Consiglio di Facoltà (dal 2014), Commissione Manifesto di Ingegneria Civile (2008-2020), responsabile piattaforma IRIS del Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali
Courses	“Discentia: le relazioni esistenti tra obiettivi formative, metodi e strumenti didattici e metodi e criteri di valutazione dell'apprendimento” (16 ore, 2017), “IRIS – l'archivio istituzionale della ricerca per la corretta gestione dei dati” (10 ore, 2020)

<b>RESEARCH</b>	
Solid and Structural Mechanics, wave propagation in elastic solids and structures, metamaterials, micro-structured media: auxetics and negative thermal expansion, contact mechanics, composites materials, continuum mechanics (finite elasticity), numerical methods (BEM, Fortran code, FEM), instability (bifurcations in elastic structures, surface instability, shear bands), fundamental solutions	

and Green's functions, atomistic models (MEAM), fracture mechanics in anisotropic media, variational formulations, integration algorithms in structural dynamics, dynamic propagation of structural failure.

Cagliari 20/04/2023

Michele Brun

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