

Curriculum vitae di *Antonio De Simone*

Sottosettori ERC primari (max 3):

PE8_4 Computational engineering, PE11_14 Computational methods for materials engineering

Sottosettori ERC secondari (max 3):

PE1_12 Mathematical physics, PE3_16 Physics of biological systems

PERSONAL DETAILS

Family name, First name: De Simone, Antonio

Birthdate: 30/06/1962

Researcher unique identifier(s): ORCID 0000-0002-2632-3057, Researcher ID F-6276-2011

URL for web site: <https://sites.google.com/view/a-desimone/home-page>

• Education and key qualifications

31/12/1992 PhD in Mechanics

Aerospace Engineering and Mechanics, University of Minnesota, USA

PhD Supervisor R.D. James

1987 Master (Laurea) in Civil Engineering

Università di Napoli Federico II, Italy

• Current positions

2017 – current Full professor of Mechanics of Solids and Structures

The BioRobotics Institute, Scuola Superiore Sant'Anna, Pisa, Italy

2002 – current Full professor of Mechanics of Solids and Structures

MathLab, SISSA-International School for Advanced Studies, Trieste, Italy

• Previous positions

1998 - 2002 Director of the research group 'Multiscale Phenomena in Materials' (Associate Professor)

Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany

1993 - 1994 Post-doctoral Associate

Dept. of Mathematics, Carnegie Mellon University, Pittsburgh, USA

1990-1998 Assistant Professor (Ricercatore)

Dept. Civil Engineering, Università Roma Tor Vergata, Italy

RESEARCH ACHIEVEMENTS AND PEER RECOGNITION

Research achievements

1. Cestola P. et al.: A flow-aware training strategy for physics-informed neural networks. *Comp. Meth. Appl. Mech. Engn.* 455 (2026), 118910 [Citations: 1 (GS), 1 (Sc)].
2. Agostinelli D. et al.: Spontaneous oscillations in eukaryotic cilia and photo-responsive rods. *J Mech Phys Solids* (2026), 210, 106529 [Citations: 1 (Sc), 2 (GS)].
3. Turuban R. et al.: Cooperative mixing through hydrodynamic interactions in *Stylonychia lemnae*. *Proceedings National Academy of Science USA* (2025), 122(37), e2500588122. [Citations: 1 (GS)]

4. Sartori P et al.: Photochemically Induced Propulsion of a 4D Printed Liquid Crystal Elastomer Biomimetic Swimmer. *Advanced Science* (2024), 11, 2308561 [Citations: 53 (GS), 45 (Sc)]
5. Gao T et al.: Shape Programming by Modulating Actuation over Hierarchical Length Scales. *Advanced Materials* 32 (2020), 2070349 [Citations: 29 (GS), 21 (Sc)].
6. Kuenstler AS et al: Blueprinting Photothermal Shape-Morphing of Liquid Crystal Elastomers. *Advanced Materials* 32 (2020), 2000609 [Citations: 203 (GS), 180 (Sc)].
7. Gompfer G et al.: The 2020 motile active matter roadmap. *Journal of Physics: Condensed Matter* 32, 193001 (2020) [Collective road map paper, citations: 669 (GS), 456 (Sc)].
8. Buskermolen et al.: Entropic forces drive cellular contact guidance. *Biophysical Journal* 116 (2019), 1994–2008 [Citations: 73 (GS), 52 (Sc)].
9. Noselli G et al.: Swimming *Euglena* respond to confinement with a behavioral change enabling effective crawling. *Nature Physics* 15 (2019), 496–502 [Citations: 83 (GS), 56 (Sc)].
10. Ambrosi D et al: Growth and remodelling of living tissues: perspectives, challenges and opportunities. *J Roy Soc Interface* 18, 277–302 (2019) [Collective road map paper, citations: 304 (GS), 213 (Sc)].
11. Rossi M et al.: Kinematics of flagellar swimming in *Euglena gracilis*: Helical trajectories and flagellar shapes. *Proc Nat Acad Sci USA* (2017), 114, 13085–13090 [Citations: 104 (GS), 70 (Sc)].
12. Giomi L, DeSimone A.: Spontaneous division and motility in active droplets. *Phys Rev Lett* 112(14) (2014), 147802 [Citations: 192 (GS), 129 (Sc)].
13. Arroyo M., DeSimone A.: Relaxation dynamics of fluid membranes. *Phys Rev E* (2009), 79(3), 031915 [Citations: 305 (GS), 200 (Sc)].
14. Dal Maso G, DeSimone A., Mora MG: Quasistatic evolution problems for linearly elastic–perfectly plastic materials. *Archive Rat Mech Anal* (2006), 180 (2), 237-291 [Citations: 272 (GS), 172 (Sc)].
15. Alouges F, DeSimone A, Lefebvre A.: Optimal strokes for low Reynolds number swimmers: an example. *J nonlinear Science* (2008), 18 (3), 277-302 [Citations: 210 (GS), 121 (Sc)].
16. DeSimone A, Kohn RV, Mueller S, Otto F.: A reduced theory for thin film micromagnetics. *Comm Pure Applied Math* (2002), 55(11), pp. 1408–1460 [Citations: 200 (GS), 122 (Sc)].
17. DeSimone A., James RD: A constrained theory of magnetoelasticity. *J Mech Phys Solids* (2002), 50(2), 283–320 [Citations: 302 (GS), 197 (Sc)].
18. Conti S, DeSimone A, Dolzmann G: Soft elastic response of stretched sheets of nematic elastomers: a numerical study. *J Mech Phys Solids* (2002), 50 (7), 1431-1451 [Citations: 235 (GS), 172 (Sc)].
19. DeSimone A.: Energy minimizers for large ferromagnetic bodies. *Archive Rat Mech Anal* (1993), 125 (2), 99-143 [Citations: 295 (GS)].
20. DeSimone A, Noselli G, Arroyo M,: Morphable Sheet Structure. EU Patent EP3884171, US Patent 11879497 (2024)

Peer recognition

Awards

2007: Keith Medal, awarded by The Royal Society of Edinburgh.

2010: Prix La Recherche, awarded by the French scientific magazine *La Recherche*.

2011: Outstanding Paper Award, Japanese Liquid Crystal Society.

2013: Corresponding member of Accademia Pontaniana, scientific academy founded in Naples in 1458
2015: Euromech Fellow (Solid Mechanics)
2019: Humboldt-Forschungspreis
2019: Joliot-Curie Chair at ESPCI, Paris
2021: Corresponding member of Istituto Veneto di Scienze Lettere e Arti, scientific academy founded in Venice in 1810

Plenary lectures (selection)

Plenary speaker at 75th Annual Meeting of the German Society for Applied Mathematics and Mechanics (GAMM), Dresden, 2004.
Plenary speaker at 8th Euro Symposium on Martensitic Transformations (Esomat 2009), Prague, 2009.
Plenary speaker at the Euromech Solid Mechanics Conference (ESMC2009), Lisbon, 2009.
Plenary speaker at Biannual SIMAI Conference (SIMAI2012), Turin, 2012.
Plenary speaker at 13th SIAM Conference on Mathematical Aspect of Materials Science (SIAM MS13), Philadelphia, USA, 2013.
Plenary speaker at 5th Italian National Congress of Bioengineering, Naples 2016.
Plenary speaker at 19th International Conference on Finite Elements in Flow Problems (FEF 2017), Rome, 2017.
Plenary speaker 11th European Conference on Mathematical and Theoretical Biology, Lisbon, 2018.
Sectional plenary speaker (Solids) ICTAM 2020, Milan (online) 2021.
Plenary speaker 10th International Conference on Coupled Problems in Science and Engineering (Coupled 2023), Chania (Greece) 2023.
Keynote speaker at 'Motile Active Matter 2024', Bonn (Germany) Nov. 2024.
Keynote speaker at WE-Heraeus-Seminar 'The Biophysics of Motile Cilia: from Structure to Function, Physikzentrum Bad Honnef (Germany), April 2025.

ADDITIONAL INFORMATION

Other contributions to the research community

Scientific Committees

2004-2008: Member of the GAMM Technical Committee on Analysis of Microstructures.
2009-present: Member of the Steering Committee for the Int. Liquid Crystal Elastomer Conferences.
2010-present: Member of the Scientific Council of the Int. Center for Mechanical Sciences (CISM).
2012-2014: Member of the Scientific Committee for the participation of the Italian supercomputing center (CINECA) to the Partnership for Advanced Computing in Europe (PRACE).
2012-2014: member of the Italian ASN committee 08-B2 Scienza delle Costruzioni (National Scientific Habilitation to the roles of Associate and Full Professor in the Mechanics of Solids and Structures).
2019-2021: Commission de recrutement du département de Mécanique de l'Ecole Polytechnique, France.

Career breaks, diverse career paths and major life events

2014-20: PI of ERC Advanced Grant (340685-MicroMotility)
2020, 2022, 2024: Member of ERC Panel PE8 for Starting Grants
2022-24: PI of ERC Proof of Concept Grant (101069436-Stripe-o-Morph)
2022: Elected CISM Secretary General (International Center for Mechanical Sciences, Udine)
2024: Chair of ERC Panel PE8 for Starting Grants

July 20th, 2026