

CURRICULUM VITAE

Curriculum presentato sotto forma di dichiarazione sostitutiva di certificazione (art. 46 DPR 28/12/2000, n. 445) e dell'atto di notorietà (art. 47 DPR 28/12/2000, n. 445).

Il sottoscritto **Noselli Giovanni**, codice fiscale _____ nato a _____ il _____
e attualmente residente a _____ consapevole che le
dichiarazioni mendaci sono punite ai sensi degli artt. 483, 495, 496 del codice penale e delle leggi
speciali in materia

DICHIARA

che le informazioni sotto riportate in merito al proprio CV corrispondono al vero.

Personal and contact information

First name and surname: Giovanni Noselli

Office address: SISSA, via Bonomea 265, 34136 Trieste, Italy

Mobile phone:

Office phone:

E-mail:

Personal webpage:

Qualification

- **26/01/2015** → Abilitazione Scientifica Nazionale (ASN) as Associate Professor in the scientific-disciplinary sector 08/B2 - Scienza delle Costruzioni.
- **13/07/2017** → Abilitazione Scientifica Nazionale (ASN) as Full Professor in the scientific-disciplinary sector 08/B2 - Scienza delle Costruzioni.

Education

- **30/10/2007** → Full Honors M.Sc. degree in Civil Engineering, Faculty of Engineering, University of Trento, 38123 Trento, Italy. Title of the thesis: 'Sviluppo di tecniche di fotoelasticimetria'. Advisor: prof. D. Bigoni.
- **23/03/2011** → Ph.D. degree in 'Engineering of Civil and Mechanical Structural Systems', Faculty of Engineering, University of Trento, 38123 Trento, Italy. Title of the thesis: 'Structural-model experiments revealing bifurcation, instability and localization'. Tutor: prof. D. Bigoni.

Professional experience

- **12/2005-10/2007** → Collaboration with the engineering society 'ENNEQUADRO Engineering', via Rosmini 40, 39100 Bolzano, Italy.
- **11/2007-03/2011** → PhD Student at the University of Trento, Faculty of Engineering, via Mesiano 77, 38123 Trento, Italy. Tutor: prof. D. Bigoni.

- **05/2011-10/2012** → PostDoc at Cambridge University, Department of Engineering, Trumpington Street, Cambridge CB2 1PZ, UK. Host: prof. N.A. Fleck.
- **11/2012-04/2013** → Collaboration with Cambridge University, Department of Engineering, Trumpington Street, Cambridge CB2 1PZ, UK. Host: prof. N.A. Fleck.
- **11/2012-11/2016** → Research fellow (NOFYSAS 2012 Fellowship) at SISSA - International School for Advanced Studies, via Bonomea 265, 34136 Trieste, Italy.
- **12/2016-present** → Assistant Professor of Solid and Structural Mechanics (RTDB ICAR/08 – Scienza delle Costruzioni) at SISSA - International School for Advanced Studies, via Bonomea 265, 34136 Trieste, Italy.

Collaboration in research projects

- **5 months** → MIUR-PRIN 2007 n. 2007YZ3B24: ‘Multi-scale Problems with Complex Interactions in Structural Engineering’. Coordinator: prof. A. Corigliano.
- **6 months** → MIUR-PRIN 2009 n. 2009XWLFKW: ‘Multi-scale modelling of material instabilities, mechanical waves, , and metamaterials’. Coordinator: prof. A. Corigliano.
- **18 months** → DARPA grant n. W91CRB-10-1-005: ‘A micro-cellular solids approach to thermo-structural materials with controlled architecture’. Coordinator: prof. H. Wadley.
- **36 months** → ERC AdG n. 340685: ‘Multiscale modeling and simulation of biological and artificial locomotion at the micron scale: from metastatic tumor cells and unicellular swimmers to bioinspired microrobots’. Coordinator: prof. A. DeSimone.

Financed research projects

- **48 months** → SISSA NOFYSAS 2012 Excellence Grant: ‘Biomimetic micro-robots’. The total funding for the four-years research project is of 60 k€.
- **12 months** → Progetti Giovani GNFM 2016: ‘Fracture and instability phenomena in soft active materials’. The total funding for the one-year research project is of 4,5 k€.

Supervision of students and postdoctoral fellows

- *PhD students*: **Mirko Tommasini**, PhD student at the University of Trento (co-advisor, 11/2014-10/2017), mathematical modelling and experiments on flutter instability in structural systems; **Daniele Agostinelli**, PhD student at SISSA (co-advisor, 10/2017-present), mathematical modelling and laboratory experiments on the mechanics of plants growth; **Dario Andrini**, PhD student at SISSA (advisor, 10/2019-present), shape morphing of active materials and thin structures.
- *PostDocs*: **Giancarlo Cicconofri** (co-supervisor, 10/2015-09/2017), mathematical modelling of biological swimming at the micro-scale (now at the GSSI of L’Aquila); **Nicola Giuliani** (co-supervisor, 10/2017-present), application of micro-PTV (particle tracking velocimetry) and BEM (boundary element method) to low Reynolds number swimming; **Davide Riccobelli** (co-supervisor, 11/2018-present), theoretical and computational modelling of smart structures inspired by the pellicle ultrastructure of euglenids.

In addition, I have mentored three MIT undergraduate students visiting SISSA in the years 2014, 2015 and 2016 through the exchange program IROP MISTI. While attending the Doctoral School, I have been co-advisor of one master's and one bachelor's thesis at the Faculty of Engineering of the University of Trento. Furthermore, I am currently supervising as 'preposto' all the experimental activities carried out at the SAMBA and BioMat laboratories of SISSA.

Teaching experience

- **2008-2009** → Teaching assistant of 'Statica' and 'Meccanica dei Solidi 1' at the University of Trento, Faculty of Engineering (total hours: 95).
- **2009-2010** → Teaching assistant of 'Statica' and 'Meccanica dei Solidi 1/2' at the University of Trento, Faculty of Engineering (total hours: 120).
- **2017-2018** → PhD course 'Topics in Continuum Mechanics' (PhD in Mathematical Analysis, Modelling, and Applications) at SISSA–International School for Advanced Studies (total hours: 60).
- **2018-2019** → PhD course 'Topics in Continuum Mechanics' (PhD in Mathematical Analysis, Modelling, and Applications) at SISSA–International School for Advanced Studies (total hours: 60).

Awards

- **11/2011** → Award for outstanding PhD thesis by the University of Trento, 38123 Trento, Italy.
- **09/2015** → AIMETA 2015 Junior Prize in Structural Mechanics, Genova, Italy. Motivation: '*Per i risultati originali ottenuti nell'ambito dello studio dei fenomeni di instabilità nelle strutture segnalando, in particolare, la capacità di coniugare gli aspetti teorici dell'argomento di ricerca con quelli sperimentali, dote non frequente nel settore scientifico disciplinare di riferimento*'.

List of publications

PhD thesis:

- * Noselli, G. (2011). Structural-model experiments revealing bifurcation, instability and localization. Doctoral School in Engineering of Civil and Mechanical Structural Systems, XXIII cycle. Tutor: prof. D. Bigoni. University of Trento, 38123 Trento, Italy.

Papers published in peer-reviewed journals:

1. McMeeking, R.M., Lucantonio, A., Noselli, G. and Deshpande, V.S. (2019). On polymer network rupture in gels in the limit of very slow straining or a very slow crack propagation rate. *Journal of the Mechanics and Physics of Solids*, in press.
2. Cicconofri, G., Arroyo, M., Noselli, G. and DeSimone, A. (2020). Morphable structures from unicellular organisms with active, shape-shifting envelopes: Variations on a theme by Gauss. *International Journal of Non-Linear Mechanics*, 118, 103278.
3. Agostinelli, D., Lucantonio, A., Noselli, G. and DeSimone, A. (2019). Nutations in growing plant shoots: The role of elastic deformations due to gravity loading. *Journal of the Mechanics and Physics of Solids*, in press.

4. Noselli, G., Beran, A., Arroyo, M. and DeSimone, A. (2019). Swimming *Euglena* respond to confinement with a behavioral change enabling effective crawling. *Nature Physics*, 15, 496-502.
5. Noselli, G., Arroyo, M. and DeSimone, A. (2018). Smart helical structures inspired by the pellicle of euglenids. *Journal of the Mechanics and Physics of Solids - Special issue honouring prof. N.A. Fleck 60th birthday*, 123, 234-246.
6. Bigoni, D., Kirillov, O.N., Misseroni, D., Noselli, G. and Tommasini, M. (2018). Flutter and divergence instability in the Pflüger column: Experimental evidence of the Ziegler destabilization paradox *Journal of the Mechanics and Physics of Solids*, 116, 99-116.
7. Bigoni, D., Misseroni, D., Tommasini, M., Kirillov, O.N. and Noselli, G. (2018). Detecting singular weak-dissipation limit for flutter onset in reversible systems. *Physical Review E*, 97, 023003.
8. Caruso, N.A., Cvetković, A., Lucantonio, A., Noselli, G. and DeSimone, A. (2018). Spontaneous morphing of equibiaxially pre-stretched elastic bilayers: the role of sample geometry. *International Journal of Mechanical Sciences*, 149, 481-486.
9. Rossi, M., Cicconofri, G., Beran, A., Noselli, G. and DeSimone, A. (2017). Kinematics of flagellar swimming in *Euglena gracilis*: helical trajectories and flagellar shapes. *Proceedings of the National Academy of Sciences USA*, 114, 13085-13090.
10. Rigosa, J., Lucantonio, A., Noselli, G., Fassihi, A., Zorzin, E., Manzano, F., Pulecchi, F. and Diamond, M.E. (2017). Dye-enhanced visualization of rat whiskers for behavioral studies. *eLife*, 6:e25290.
11. Lucantonio, A. and Noselli, G. (2017). Concurrent factors determine toughening in the hydraulic fracture of poroelastic composites. *Meccanica* 52, 3489-3498.
12. Noselli, G., Lucantonio, A., McMeeking, R.M. and DeSimone, A. (2016). Poroelastic toughening in polymer gels: A theoretical and numerical study. *Journal of the Mechanics and Physics of Solids* 94, 33-46.
13. Lucantonio, A., Noselli, G., Trepas, X., DeSimone, A. and Arroyo, M. (2015). Hydraulic fracture and toughening of a brittle layer bonded to a hydrogel. *Physical Review Letters* 115, 188105.
14. DeSimone, A., Gidoni, P. and Noselli, G. (2015). Liquid Crystal Elastomer Strips as Soft Crawlers. *Journal of the Mechanics and Physics of Solids* 84, 254-272.
15. Misseroni, D., Noselli, G., Zaccaria, D. and Bigoni, D. (2015). The deformation of an elastic rod with a clamp sliding along a smooth and curved profile. *International Journal of Solids and Structures* 69-70, 491-497.
16. Noselli, G. and DeSimone, A. (2014). A robotic crawler exploiting directional frictional interactions: experiments, numerics, and derivation of a reduced model. *Proceedings of the Royal Society A* 470, 20140333.
17. Gidoni, P., Noselli, G. and DeSimone, A. (2014). Crawling on directional surfaces. *International Journal of Non-Linear Mechanics* 61, 65-73.
18. Noselli, G., Tatone, A. and DeSimone, A. (2013). Discrete one-dimensional crawlers on viscous substrates: achievable net displacements and their energy cost. *Mechanics Research Communications* 58, 73-81.

19. DeSimone, A., Guarnieri, F., Noselli, G. and Tatone, A. (2013). Crawlers in viscous environments: linear vs nonlinear rheology. *International Journal of Non-Linear Mechanics* 56, 142–147.
20. Noselli, G., Deshpande, V.S. and Fleck, N.A. (2013). An analysis of competing toughening mechanisms in layered and particulate solids. *International Journal of Fracture* 183, 241–258.
21. Bigoni, D., Misseroni, D., Noselli, G. and Zaccaria, D. (2012). Effects of constraint's curvature on structural stability: tensile buckling and multiple bifurcations. *Proceedings of the Royal Society A* 468, 2191–2209.
22. Bigoni, D. and Noselli, G. (2011). Experimental evidence of flutter and divergence instabilities induced by dry friction. *Journal of the Mechanics and Physics of Solids* 59, 2208–2226.
23. Zaccaria, D., Bigoni, D., Noselli, G. and Misseroni, D. (2011). Structures buckling under tensile dead load. *Proceedings of the Royal Society A* 467, 1686–1700.
24. Noselli, G., Dal Corso, F. and Bigoni, D. (2010). The stress intensity near a stiffener disclosed by photoelasticity. *International Journal of Fracture* 166 , 91–103.
25. Bigoni, D. and Noselli, G. (2010). Localized stress percolation through dry masonry walls. Part II – Modelling. *European Journal of Mechanics A/Solids* 29 , 299–307.
26. Bigoni, D. and Noselli, G. (2010). Localized stress percolation through dry masonry walls. Part I – Experiments. *European Journal of Mechanics A/Solids* 29 , 291–298.

Chapters in refereed books:

1. Cicconofri, G., Becker, F., Noselli, G., DeSimone, A. and Zimmermann, K. (2016). The inversion of motion of bristle bots: analytical and experimental analysis. In: '*CISM Lecture Notes No. 569 - ROMANSY 21 - Robot Design, Dynamics and Control*', Parenti-Castelli, V. and Schiehlen, W. (eds.), Springer, Wien-New York.
2. Bigoni, D., Bosi, F., Misseroni, D., Dal Corso, F. and Noselli, G. (2015). New phenomena in nonlinear elastic structures: from tensile buckling to configurational forces. In: '*CISM Lecture Notes No. 562 - Extremely Deformable Structures*', Bigoni, D. (ed.), Springer, Wien-New York.
3. Bigoni, D., Misseroni, D., Noselli, G. and Zaccaria, D. (2013). Surprising instabilities of simple elastic structures. In: '*Nonlinear physical systems - Spectral analysis, stability and bifurcation*', Kirillov, O.N. and Pelinovsky, D.E. (eds.), Wiley-ISTE, London.

Participation to conferences (selected)

- a. Noselli, G., Arroyo, M. and DeSimone, A. (2019). Helical structures inspired by the euglenoid pellicle. XXIV Congresso Associazione Italiana di Meccanica Teorica e Applicata - AIMETA2019, Rome, Italy, September 15-19, 2019.
- b. Noselli, G. (2018). Poroelastic toughening in polymer gels. 10th European Solid Mechanics Conference - ESMC18, Bologna, Italy, July 2-6, 2018. Symposium in honour of Prof. N.A. Fleck.
- c. Noselli, G., Arroyo, M., Beran, A. and DeSimone, A. (2017). Metaboly and shape control in euglenids. XXIII Congresso Associazione Italiana di Meccanica Teorica e Applicata - AIMETA2017, Salerno, Italy, September 4-7, 2017.

- d. Noselli, G., Lucantonio, A., Trepas, X., Arroyo, M. and DeSimone, A. (2016). Hydraulic fracture and toughening in cell monolayers. 24th International Congress of Theoretical and Applied Mechanics - ICTAM2016, Montréal, Canada, August 21-26, 2016.
- e. Noselli, G., Lucantonio, A., Trepas, X., Arroyo, M. and DeSimone, A. (2015). Hydraulic fracture and toughening in epithelial cell monolayers. XXII Congresso Associazione Italiana di Meccanica Teorica e Applicata - AIMETA2015, Genova, Italy, September 14-17, 2015.
- f. Noselli, G., Lucantonio, A., Trepas, X., Arroyo, M. and DeSimone, A. (2015). Hydraulic fracture and toughening in epithelial layers. International Workshop on Modelling across the Biology-Mechanics Interface - 2015, Castro Urdiales, Spain, September 1-4, 2015.
- g. Noselli, G. and DeSimone, A. (2015). Biological crawling and swimming micro-organisms: a case study in shape control for locomotion purposes. 9th European Solid Mechanics Conference - ESMC15, Madrid, Spain, July 6-10, 2015.
- h. Noselli, G., Bigoni, D., Dal Corso, F. and Misseroni, D. (2014). Stress singularity and neutrality around a stiffener revealed by photoelasticity. 16th International Conference on Experimental Mechanics - ICEM16, Cambridge, UK, July 7-11, 2014.
- i. Noselli, G., DeSimone, A. and Tatone, A. (2013). Crawling motility on viscous substrates. XXI Congresso Associazione Italiana di Meccanica Teorica e Applicata - AIMETA 2013, Torino, Italy, September 17-20, 2013.
- l. Noselli, G., Deshpande, V.S. and Fleck, N.A. (2012). Composite toughening by layering. 23rd International Congress of Theoretical and Applied Mechanics - ICTAM2012, Beijing, China, August 19-24, 2012.
- m. Noselli, G. and Bigoni, D. (2009). Localized stress percolation through dry masonry walls. III Riunione del Gruppo Materiali dell'AIMETA - GMA2009, Milano, Italy, January 23-24, 2009.

Plenary lectures

- a. Noselli, G. (2015). Hydraulic toughening in biological tissues. XXII Congresso Associazione Italiana di Meccanica Teorica e Applicata - AIMETA2015, Genova, Italy, September 16, 2015.

Invited talks

- a. Noselli, G. (2019). Smart helical structures inspired by the euglenoid pellicle. RAMSS 2019 - Recent advances in the mechanics of solids and structures, Trento, Italy, June 6-7, 2019. Symposium in honour of Prof. D. Bigoni.
- b. Noselli, G. (2018). Poroelastic toughening in polymer gels. 10th European Solid Mechanics Conference - ESMC18, Bologna, Italy, July 2-6, 2018. Symposium in honour of Prof. N.A. Fleck.
- c. Noselli, G. (2017). Fracture in epithelial tissues and polymer gels. Assemblea Scientifica del GNFM 2017 - Montecatini Terme, Italy, May 4-6, 2017.
- d. Noselli, G. and DeSimone, A. (2015). Biological crawling and swimming micro-organisms: a case study in shape control for locomotion purposes. BarcelonaTech, Barcelona, Spain, July 3, 2015. Host: prof. M. Arroyo.

- e. Noselli, G., Deshpande, V.S. and Fleck, N.A. (2015). Toughening mechanisms in particulate and in layered solids. State of the art and challenges in thermal and mechanical modelling of ceramic materials - HOTBRICKS2015, Trento, Italy, March 20, 2015.
- f. Noselli, G. (2011). Structural-model experiments revealing bifurcation, instability and localization. 4th International Workshop of Young Researchers on the Mechanics of Materials and Structures - YRMMS-2011, Trieste, Italy, October 10-11, 2011.

Conference and workshop organization

- a. Co-organizer of the mini-symposium ‘Mechanics and shape control of active structures’ at the XXIV AIMETA congress - AIMETA2019, Roma, Italy, September 15-19, 2019.
- b. Co-organizer of the workshop ‘MicroMotility 2019 - Biological micromotility and bio-inspired micro-robotics’, Venice, Italy, March 25-29, 2019.
- c. Co-organizer of the mini-symposium ‘Mechanics and shape control of biological membranes and thin structures’ - ESMC18, Bologna, Italy, July 3, 2018.
- d. Co-organizer of the workshop ‘Euglena Day’ - IEEE 2018 Soft Robotics Satellite Event, Livorno, Italy, April 23, 2018.
- e. Co-organizer of the mini-symposium ‘Soft Active Materials’ at the XXIII AIMETA congress - AIMETA2017, Salerno, Italy, September 4-7, 2017.
- f. Co-organizer of the mini-symposium ‘Soft Active Materials’ at the XXII AIMETA congress - AIMETA2015, Genova, Italy, September 14-17, 2015.
- g. Co-organizer of the 6th International Workshop of Young Researchers on the Mechanics of Materials and Structures - YRMMS-2014, Trieste, Italy, October 22-24, 2014.

Editorial activity and professional memberships

- Member of the executive committee of GMA - Gruppo Materiali dell’AIMETA.
- Guest editor of the special issue of *Meccanica* on the ‘Active behavior in soft matter and mechanobiology’. *Meccanica*, Springer, 2017.
- Reviewer for the following international journals: *Acta Biomaterialia*, *Applied Physics Letters*, *Communications in Nonlinear Science and Numerical Simulation*, *Engineering Failure Analysis*, *Engineering Fracture Mechanics*, *Engineering Structures*, *European Journal of Mechanics-A/Solids*, *International Journal of Fracture*, *Journal of the Mechanics and Physics of Solids*, *Mathematics and Mechanics of Solids*, *Meccanica*, *Mechanics Research Communications*, *Optics and Lasers in Engineering*, *Philosophical Transactions of the Royal Society A*, *Proceedings of the Royal Society A*, *Journal of Elasticity*, *Journal of the European Ceramic Society*, *Journal of Mechanics of Materials and Structures*, *SAGE Open*.

Patents and results in technology transfer

- **06/2014** → European patent n.EP18382845 (deposited November 23, 2018). Title: ‘Flexible deformable sheet structure’. Inventors: Antonio DeSimone, Giovanni Noselli, and Marino Arroyo.

- **06/2014** → Italian patent n.IT1408351-B (deposited June 7, 2011, published December 8, 2012, patented June 13, 2014). Title: ‘Dispositivo strumentato per una caratterizzazione di una struttura interna di un blocco di formaggio’. Inventors: Davide Bigoni, Agostino Cavazza, and Giovanni Noselli.

Language skills

- Italian: mother tongue;
- English: good spoken and written English;
- German: good spoken and written German.

Il sottoscritto esprime il proprio consenso affinché i dati personali forniti possano essere trattati nel rispetto del D. Lgs. n. 196/2003, per gli adempimenti connessi alla presente procedura selettiva.

Trieste, 26/11/2019

Giovanni Noselli