

## TITLES

Prof. Ing. Luciano Afferrante

Full Professor in Mechanical Design and Machine Construction

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Web of Science Researcher ID: <http://www.researcherid.com/rid/H-1086-2011>

Scopus Researcher ID: <http://www.scopus.com/authid/detail.url?authorId=6602909092>

Google Scholar Citations: <http://scholar.google.it/citations?user=fxANFswAAAAJ>

ResearchGate: [https://www.researchgate.net/profile/Luciano\\_Afferrante](https://www.researchgate.net/profile/Luciano_Afferrante)

## EDUCATION

LA obtained the degree in Mechanical Engineering cum laude, at the Polytechnic University of Bari, discussing the thesis "*Studio del transitorio nel contatto termoelastico di sistemi frananti e di frizione*". In 2002 he obtained the qualification for the profession of engineer and, at the end of the same year, obtained a grant for the PhD in Mechanical Engineering at the Polytechnic University of Bari. He obtained his PhD in 2006 with the thesis "*ThermoElastoDynamic Instability (TEDI) in sliding contacts*".

In the period 2006-2011 he carried out his activity as research fellow at the Polytechnic University of Bari

## ACADEMIC POSITION

In 2011 Luciano Afferrante obtained a position of assistant professor in Mechanical Design and Machine Construction at the Polytechnic University of Bari. In 2014 he received confirmation in this role. In the same year he first obtained the national scientific qualification for the role of associate professor in Mechanical Design and Machine Construction and later obtained a position at the Department of Mechanics, Mathematics and Management of the Polytechnic University of Bari. In 2017 he obtained the national scientific qualification for the role of full professor in Mechanical Design and Machine Construction. In 2021 he has obtained a position as full professor in Mechanical Design and Machine Construction at the Polytechnic University of Bari.

## INSTITUTIONAL ROLES

since 2021 LA is component of the scientific board of AIAS – Italian Scientific Society of Mechanical Design and Machine Construction.

2020 – on designation of the Polytechnic University of Bari, he was appointed as Chairman of the Board (D.D.G. N. 579 - 26/10/2020) in a public competition for the recruitment of a professional technical figure - (cat. D) mechanical engineer - called by ARPA Puglia (Agenzia Regionale per la Prevenzione e la Protezione dell'Ambiente della Regione Puglia).

2020 – on designation of the Department of Mechanics, Mathematics and Management (DMMM), he was appointed in the Board (and specifically he was Chairman of the Board) for awarding teachers of DMMM, as planned in the project of Department of Excellence (D.D. 47/2020).

since 2020 he is component of the Executive Board (as elected representative for the associate professors) of the Department of Mechanics, Mathematics and Management (DMMM) of Polytechnic University of Bari (D. R. 294/2020).

2019 – on designation of the Polytechnic University of Bari, he served as Chairman of the Board for negotiated procedure for the award of gas consumption detection services and ancillary services (CIG 796565499F), for ReteGas Bari S.p.A. (D.D.G. n.41 - 21/10/2019).

since 2018 he is delegate (D.D. 27/2018) to the Coordination of the Activities of the Department of Excellence (DMMM) of the Polytechnic University of Bari.

since 2017 he is component of REPRISE (Register of Expert Peer Reviewers for Italian Scientific Evaluation).

2014-2018 he was component (D. R. 470/2014) of the Patent Committee of the Polytechnic University of Bari.

2012-2014 he was component of the Executive Board (as elected representative for the researchers) of the Department of Mechanics, Mathematics and Management (DMMM) of Polytechnic University of Bari.

since 2011 he is component of the PhD board in "Mechanical and Management Engineering" of Polytechnic University of Bari.

2011 - on designation of the Polytechnic University of Bari, he was member of the board of examination of professional engineers (I and II session).

## RESEARCH EXPERIENCES

His scientific interest covers different topics. Specifically, it is focused in the following areas: contact mechanics, tribology, friction, adhesion, biomimetics, fracture mechanics, superhydrophobicity, biomechanics of aortic valves, thermo-elastic and dynamic instabilities, rolling contact fatigue and corrugation in railways, mechanical design of innovative mechanical components, rotordynamics of axial turbomachines. He has published more than 140 works in international journals, international and national conferences. He has also published scientific contributions on invitation for important Publishers (e.g. Springer, Pan Stanford Publishing). He regularly does activities of peer review for numerous international scientific journals. He has been member of review committees of important international conferences and has been member of the Editorial Board of International scientific journals. He has been scientific coordinator in many research projects funded by private and public companies.

He is also scientific coordinator of the framework agreement between Polytechnic University of Bari and Magna S.p.A. of Modugno - BA (which is a manufacturer of automatic transmissions for major car manufacturers such as REN, DAIMLER, FORD).

He is a founding member of PoliMech s.r.l. – Strutture Meccaniche Innovative, spin-off of Polytechnic University of Bari, founded in 2008. The main activity of the spin-off is the scientific knowledge transfer to companies. There have been numerous actions of the spin-off in this field. In particular, Luciano Afferrante was scientific coordinator for many of these activities, including, for example:

- the "Development of a self-cleaning screw conveyor for the milling industry", funded by TecnoMulipast, inside the project "Tecno Innovation: P.O.R. PUGLIA 2007-2013: P.I.A. Titolo IX Asse I - Line of Action 1.1.2 Industrial Research and Experimental Development). (Funding: 100.000,00 €),

- study aimed at designing a test bench for clutch systems (per la MASMEC S.p.A.),

- modal characterization of supporting structures for antennas of mobile telephone base station and wind turbines (Vodafone S.p.A.),

- mechanical characterization of the materials of mobile crane arms (FAVER S.p.A).

He is member of the board of the PhD course in Mechanical and Management Engineering since 2011.

## FUNDINGS:

Some of the fundings obtained:

- 2018 - 2021 - "Machines and equipment for the manufacturing of mechanical transmissions enabling specifications of Industry 4.0" funded by GETRAG SpA -Magna Powertrain GmbH (Funding: ~400.000,00 €).

- 2020 – "Study of the wind actions on thin structures (non-lattice pole for mobile telephony) to find a procedure to calculate the dynamic factor and to develop an app for this purpose", funded by A2F Engineering s.r.l. (Funding: 2.0000,00 €).

- 2019-2020 – "Study of the filtering properties of cyclone vessels and filters cartridges for gas-solid and gas-liquid separation", funded by Tecnomec Engineering s.r.l. (Funding: 80.000,00 €).

- 2020 FRA (University Research Funds, Funding Announcement 2019) - Scientific coordinator of

the project “Material and topography design aimed at optimizing the active control of the attachment/detachment process of structural adhesives on dry and wet surfaces.” (Funding: ~4.000,00 €).

- 2018-2019 Scientific coordinator of the Research Unit “Static and Dynamic analysis of the structural behavior of the AGV vehicle” (OR6.2), inside the Research Program INNONETWORK “OmniAGV 4.0 - Omnidirectional automatic guided vehicle, enabling specifications of Industry 4.0” del P.O.R. PUGLIA 2014-2020 - (Funding of Unit 6.2: ~60.000,00 €).

2017 FFABR - Founding of the Research Base Activity - Associate Professors (Funding: 3.000,00 €).

- 2016 - Research project “Surface roughness characterization of tubes in polypropylene” funded by ATP s.r.l. (Funding: 6.600,00 €).

- 2016 FRA (University Research Funds, Funding Announcement 2016) - Scientific coordinator of the project “Optimization of the super-hydrophobic properties of rough surfaces” (Funding: ~1.000,00 €).

- 2012-2015 Scientific coordinator inside the project "Innovative technologies for reduction of emissions, fuel consumption and operating costs in HEAVY DUTY engines" (Activity 9.1: Design with numerical methodologies, inside OR9: Innovative Materials and manufactures for optimized mechatronic actuators. (OR9: 668.000,00 €; Activity 9.1: 105.000,00 €).

- 2013 - Research project “Numerical and experimental characterization of the frequency response of guyed poles. Evaluation of system stiffness changes due to variation of the guys pretension” funded by Vodafone SpA (Funding: 2.800,00 €).

- 2013 - Research project “Effect of the crack propagation in the welded joint between poles and flange on the variation of the natural frequency of the systems. Design of a remote system to control the natural frequency of the pole and to identify the possible presence of cracks at the base of the pole” funded by Vodafone SpA (Funding: 6.400,00 €).

Collaboration in the following research projects:

- 2012 FRA (University Research Funds, Funding Announcement 2012) - Scientific coordinator of the project “Bio-inspired strategies to control friction, adhesion and wettability of micro-/nano-structured surfaces” (Funding: ~4.000,00 €).

#### EDITORIAL ACTIVITY

- Since 2018 member of the Editorial Board of the international journal “Frontiers in Mechanical Engineering - Tribology” (ISSN: 2297-3079, Indexed in: Google Scholar, DOAJ, CrossRef, CLOCKSS)

- Since 2018 member of the Editorial Board of the international journal “Mathematical and Computational Applications” (ISSN 2297-8747; ISSN 1300-686X for printed edition, Indexed in Inspec (IET), MathSciNet (AMS) and Emerging Sources Citation Index)

- 2017-2020 Editorial Board Member of the international journal “The Open Mechanical Engineering Journal” (ISSN: 1874-155X, Scopus ID: 19700186908)

- 2013-2016 Editorial Board Member of "International Journal of Advanced Engineering Applications (IJAEA)" (ISSN:2277-7345A).

#### REFEREE ACTIVITY

Referee for many international scientific journals including:

Scientific Report, Soft Matter, Journal of the Royal Society Interface, WEAR, International Journal of Solids and Structures, International Journal of Mechanical Science, Proceedings of the Institution of Mechanical Engineers, Part C, Journal of Mechanical Engineering Science, Applied Thermal Engineering, Tribology International, ASME - Journal of Tribology, Mathematical Problems in Engineering, Journal of Vibration and Control, Journal of Engineering Mathematics, Applications and Applied Mathematics, The Open Mechanics Journal, International Journal of Industrial and Systems Engineering, Australian Journal of Mechanical Engineering, Journal of Engineering Tribology, Technical Gazette, Surface Topography: Metrology and Properties, Journal of Strain

Analysis for Engineering Design, Current Applied Physics, Advances in Mechanical Engineering, Review of Scientific Instruments, Chemical Engineering Science.

#### COLLABORATION AND RESEARCH ACTIVITIES WITH FOREIGN UNIVERSITIES

Luciano Afferrante has developed many research collaborations with famous foreign researchers with visiting periods in their Universities and/or publication of scientific papers. We can mention:

- Prof. J.R. Barber (University of Michigan - USA) on ThermoElastic and ThermoElastoDynamic Instability,
- Prof. A. Klarbring (Linkoping University – Sweden) on existence, uniqueness and stability of solutions in thermoelastic contact problems,
- Prof. Ponter (University of Leicester – United Kingdom) on Rolling Contact Fatigue,
- Prof. A. Sackfield (University of Oxford - United Kingdom) on corrugation problems in railway tracks,
- Prof. Stanislav N. Gorb (Christian-Albrechts-University of Kiel) on biomimetic topics,
- Prof. Daniele Dini (Imperial College of London) on tribology problems,
- Prof. Antoine Chateauminis (Ecole Supérieure de Physique et Chimie Industrielle (ESPCI) – Paris) on adhesion of viscoelastic materials,
- Dr. Bo Persson (Peter Gruenberg Institute of the Research Center of Juelich - Germany) on contact mechanics of rough surfaces.

#### AFFILIATIONS

- Società Scientifica Italiana di Progettazione Meccanica e Costruzione di Macchine AIAS (already - Associazione Italiana per l'Analisi delle Sollecitazioni)
  - Centro di Eccellenza in Meccanica Computazionale (CEMeC) - Polytechnic University of Bari
  - Associazione Italiana di MEccanica Teorica e Applicata (AIMETA)
- EUROpean MECHANics Society (EUROMECH)

#### SPECIAL MENTIONS

- “HOT PAPER AWARD” 2014 for the paper “The effect of drop volume and micropillar shape on the apparent contact angle of ordered microstructured surfaces”, *Soft Matter*, Vol.10 (22), pp. 3906-3914, 2014 (doi: 10.1039/C3SM53104J). Chemical Communications papers featured in this section have been rated "in the top 10%" of papers published. This paper also received a special mention from the Journal Editorial Office and the cover on the issue in which the article appears.
- The paper “Meeting the Contact-Mechanics Challenge”, *Trib. Letters*, 2017, doi: 10.1007/s11249-017-0900-2 is Top Article from *Tribology Letters* (2018).
- Excellent rating obtained in the VQR 2011-2014, for all presented products.
- Certificate of “Outstanding Contribution in Reviewing” 2017, (The Editors of *Tribology International*)
- Certificate of “Outstanding Contribution in Reviewing” 2017, (The Editors of *International Journal of Solids and Structures*)

#### TEACHING ACTIVITY

Since 2008 Luciano Afferrante taught in many bachelor’s degree and master’s degree courses in the area of Mechanical Design at University of Molise and Politecnico of Bari. He has supervised many PhD, training, and graduating Projects of students.

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