

# ❧ CURRICULUM VITAE - FRANCESCO D'ANNIBALE ❧

## PERSONAL INFORMATION

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First Name: Francesco  
Last Name: D'Annibale  
Date of Birth: June 27, 1981  
Nationality: Italian  
ID Orcid: 0000-0002-6580-9586  
ID Scopus: 56414911700

### Academic Address

DICEAA & M&MoCS  
University of L'Aquila  
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Italy

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## EDUCATION

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- 2006      Master's Degree in Civil Engineering, University of L'Aquila. Title of the thesis: *Meccanica dei continui elasto-plastici danneggiabili: modelli analitici, algoritmi numerici ed applicazioni a semplici modelli strutturali* (Elasto-plastic and damage continuum mechanics: analytical models, numerical algorithms and simple structural applications). Supervisor: Prof. Angelo Luongo. Graduated with full marks (110/110 cum laude).
- 2010      Ph. D. in *Ingegneria Civile e del Territorio* (Civil and Environmental Engineering), University of L'Aquila. Title of the thesis: *Modelli costitutivi ed analisi di strutture soggette a danno ed usura per contatto quasi-statico* (Constitutive models and analysis of structures subjected to damage and wear due to quasi-static frictional contact). Date of defence: July 5, 2010.

## POSITIONS

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- 2010 - 2014      **Post-Doc** at Dipartimento di Ingegneria Civile, Edile-Architettura e Ambientale (DICEAA), University of L'Aquila. Title of the Research: *Danneggiamento a fatica di strutture multi-strato* (Fatigue damage in multi-layered structures).
- 2014 - 2016      **Post-Doc** at International Research Center on Mathematics and Mechanics of Complex Systems (M&MoCS), University of L'Aquila. Title of the Research: *Dinamica e stabilità di sistemi Piezo-Elettro-Meccanici (PEM) sollecitati da azioni non conservative* (Dynamics and stability of Piezo-Electro-Mechanical (PEM) systems under nonconservative actions).
- 2016 - Present      **Assistant Professor** in Solids and Structural Mechanics (SSD ICAR/08 - Scienza delle Costruzioni) at Dipartimento di Ingegneria Civile, Edile-Architettura e Ambientale (DICEAA), University of L'Aquila.

## ACADEMIC RESPONSIBILITIES

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- 2016 - Present Member of the Executive Committee of the International Research Center on Mathematics and Mechanics of Complex Systems (M&MoCS), University of L'Aquila.
- 2017 - Present Member of the Teaching Staff in the doctoral school of Civil, Construction-Architectural and Environmental Engineering, University of L'Aquila.
- 2018 - Present President of the Administrative Board of the Academic Spin-off *Diagnostic, Retrofitting, Innovation, Materials and Structures* (DRIMS), University of L'Aquila.
- 2018 - Present Director of the *Laboratory of innovative materials for construction* of DICEAA, University of L'Aquila.

## RESEARCH FIELDS

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- Linear and nonlinear oscillations of one-dimensional structural systems
- Passive control of elastic systems via added piezoelectric devices
- Stability and nonlinear oscillations of elastic systems under conservative and nonconservative actions
- Perturbation methods for multiple-bifurcations analysis of multi-parameter dynamical systems
- Local and nonlocal damage constitutive models
- Fatigue damage and wear constitutive modeling in multi-layered structures
- Dynamic approach and numerical algorithms within the framework of the Generalized Beam Theory

## BIBLIOMETRIC INDEXES

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	Scopus	Google Scholar
h-index	9	10
Citations	213	250

*Last updated September 11, 2018*

## PUBLICATIONS

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### PEER-REVIEWED JOURNAL ARTICLES

- [1] Di Nino, S., D'Annibale, F., Luongo, A. (2017). A simple model for damage analysis of a frame-masonry shear-wall system, *International Journal of Solids and Structures*, **118**, 119-134, doi: 10.1016/j.ijsolstr.2017.09.007.
- [2] Luongo, A., D'Annibale, F. (2017). Invariant subspace reduction for linear dynamic analysis of finite-dimensional viscoelastic structures, *Meccanica*, **52**(13), 3061-3085, doi: 10.1007/s11012-017-0741-y.
- [3] Ferretti, M., D'Annibale, F., Luongo, A. (2017). Flexural-torsional flutter and buckling of braced foil beams under a follower force, *Mathematical Problems in Engineering*, art. no. 2691963, doi: 10.1155/2017/2691963.
- [4] Turco, E., Golaszewski, M., Giorgio, I., D'Annibale, F. (2017). Pantographic lattices with non-orthogonal fibres: Experiments and their numerical simulations, *Composites Part B: Engineering*, **118**, 1-14, doi: 10.1016/j.compositesb.2017.02.039.
- [5] D'Annibale, F. (2016). Piezoelectric control of the Hopf bifurcation of Ziegler's column with nonlinear damping, *Nonlinear Dynamics*, **86**(4), 2179-2192, doi: 10.1007/s11071-016-2866-2.
- [6] Luongo, A., D'Annibale, F., Ferretti, M. (2016). Hard loss of stability of Ziegler's column with nonlinear damping, *Meccanica*, **51**(11), 2647-2663, doi: 10.1007/s11012-016-0471-6.
- [7] D'Annibale, F., Ferretti, M., Luongo, A. (2016). Improving the linear stability of the Beck's beam by added dashpots, *International Journal of Mechanical Sciences*, **110**, 151-159, doi: 10.1016/j.ijmecsci.2016.03.008.
- [8] Luongo, A., D'Annibale, F. (2016). Nonlinear hysteretic damping effects on the post-critical behaviour of the visco-elastic Beck's beam, *Mathematics and Mechanics of Solids*, **22**(6), 1347-1365, doi: 10.1177/1081286516632381.
- [9] Luongo, A., Ferretti, M., D'Annibale, F. (2016). Paradoxes in dynamic stability of mechanical systems: investigating the causes and detecting the nonlinear behaviors, *SpringerPlus*, **5**(60), doi: 10.1186/s40064-016-1684-9.
- [10] D'Annibale, F., Rosi, G., Luongo, A. (2016). Piezoelectric control of Hopf bifurcations: a nonlinear discrete case study, *International Journal of Non-Linear Mechanics*, **80**, 160-169, doi: 10.1016/j.ijnonlinmec.2015.09.012.
- [11] D'Annibale, F., Rosi, G., Luongo, A. (2015). Controlling the Limit-Cycle of the Ziegler Column via a Tuned Piezoelectric Damper, *Mathematical Problems in Engineering*, vol. 2015, Article ID 942859, 9 pages, doi:10.1155/2015/942859.
- [12] D'Annibale, F., Rosi, G., Luongo, A. (2014). On the failure of the 'Similar Piezoelectric Control' in preventing loss of stability by nonconservative positional forces, *Zeitschrift für Angewandte Mathematik und Physik*, **66**(4), 1949-1968, doi: 10.1007/s00033-014-0477-7.
- [13] D'Annibale, F., Rosi, G., Luongo, A. (2014). Linear stability of piezoelectric-controlled discrete mechanical systems under nonconservative positional forces, *Meccanica*, **50**(3), 825-839, doi: 10.1007/s11012-014-0037-4.
- [14] Taig, G., Ranzi, G., D'Annibale, F. (2014). An unconstrained dynamic approach for the Generalised Beam Theory, *Continuum Mechanics and Thermodynamics*, **27**(4), 879-904, doi: 10.1007/s00161-014-0358-5.
- [15] Luongo, A., D'Annibale, F. (2014). On the destabilizing effect of damping on discrete and continuous circulatory systems, *Journal of Sound and Vibration*, **333**(24), 6723-6741, doi: 10.1016/j.jsv.2014.07.030.
- [16] Luongo, A., D'Annibale, F. (2014). A paradigmatic minimal system to explain the Ziegler paradox, *Continuum Mechanics and Thermodynamics*, **27**(1-2), 211-222, doi: 10.1007/s00161-014-0363-8.

- [17] Piccardo, G., D'Annibale, F., Zulli, D. (2014). On the contribution of Angelo Luongo to Mechanics: in honour of his 60th Birthday, *Continuum Mechanics and Thermodynamics*, **27**(4), 507-529, doi: 10.1007/s00161-014-0388-z.
- [18] Luongo, A., D'Annibale, F. (2013). Double zero bifurcation of non-linear viscoelastic beams under conservative and non-conservative loads, *International Journal of Non-Linear Mechanics*, **55**, 128-139, doi: 10.1016/j.ijnonlinmec.2013.05.007.
- [19] D'Annibale, F., Luongo, A. (2013). A damage constitutive model for sliding friction coupled to wear, *Continuum Mechanics and Thermodynamics*, **25**(2-4), 503-522, doi: 10.1007/s00161-012-0283-4.
- [20] Luongo, A., D'Annibale, F. (2012). Bifurcation analysis of damped visco-elastic planar beams under simultaneous gravitational and follower forces, *International Journal of Modern Physics B*, **26**(25), art. no. 1246015, doi: 10.1142/S0217979212460150.
- [21] Luongo, A., D'Annibale, F. (2011) Linear stability analysis of multiparameter dynamical systems via a numerical-perturbation approach, *AIAA Journal*, **49**(9), 2047-2056, doi: 10.2514/1.J051023.

#### Ph. D. THESIS

- [1] D'Annibale, F., (2010). Modelli costitutivi ed analisi di strutture soggette a danno ed usura per contatto quasi-statico (Constitutive models and analysis of structures subjected to damage and wear due to quasi-static friction contact), *Università degli Studi dell'Aquila*.

#### BOOK CHAPTERS

- [1] Luongo, A., D'Annibale, F. (2015). Linear and nonlinear damping effects on the stability of the Ziegler column, in Belhaq, Mohamed (Editor), *Springer Proceedings in Physics Vol. 168: Structural Nonlinear Dynamics and Diagnosis*, Springer International Publishing Switzerland, ISBN: 978-3-319-19850-7, doi: 10.1007/978-3-319-19851-4.

## CONFERENCE PROCEEDINGS

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#### PEER-REVIEWED PROCEEDINGS

- [1] Di Nino, S., D'Annibale, F., Luongo, A. (2014). A Simple Kinematical Model of Frame-Masonry Shear-Wall Systems, in B.H.V. Topping, P. Iványi, (Editors), *Proceedings of the Twelfth International Conference on Computational Structures Technology*, Civil-Comp Press, Stirlingshire (UK), Paper 180, doi:10.4203/ccp.106.180.
- [2] D'Annibale, F., Rosi, G., Luongo, A. (2013). Linear stability analysis of piezoelectric controlled beams subjected to nonconservative loads, *Atti del XXI Congresso Nazionale AIMETA - CD ROM*, Torino (Italy), 17-20 September 2013.
- [3] Luongo, A., D'Annibale, F. (2011). Nonlinear bifurcations of damped visco-elastic planar beams under simultaneous gravitational and follower forces, *Proceedings of the Fifth International Scientific Conference on Physics and Control - PhysCon 2011*, Leon (Spain), 5-8 September 2011.
- [4] Luongo, A., D'Annibale, F. (2011). Dynamic modelling of visco-elastic beams, *Atti del XX Congresso Nazionale AIMETA - CD ROM*, Bologna (Italy), 12-15 September 2011.
- [5] Luongo, A., D'Annibale, F. (2009). Linear stability analysis of multiparameter dynamical systems via a numerical-perturbation approach, *Atti del XIX Congresso Nazionale AIMETA - CD ROM*, Ancona (Italy), 14-17 September 2009.
- [6] Beolchini G.C., Conflitti, G., Contento, A., D'Annibale, F., Di Egidio, A., Di Fabio, F., Fanale, L., Galeota, D., Gattulli, V., Lepidi, M., Potenza, F. (2009). Il comportamento degli edifici della Facoltà di Ingegneria dell'Aquila durante la sequenza sismica dell'Aprile 2009. *Atti del XIII Convegno di Ingegneria Sismica ANIDIS*, Bologna (Italy), June 28-July 2 2009.

## PARTICIPATION IN CONFERENCES

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### INTERNATIONAL

- [1] Luongo, A., Zulli, D., D'Annibale, F., A mixed numerical-perturbative algorithm for static analysis of nonlinear planar fabrics, *Euromech Colloquium 579*, Arpino, Italy, April 3-8 2017.
- [2] D'Annibale, F., Rosi, G., Luongo, A., Controlling the limit-cycle of the Ziegler column via piezoelectric dampers, *Euromech Colloquium 562*, Sperlonga, Italy, May 24-28 2015.
- [3] Luongo, A., D'Annibale, F., Linear and nonlinear damping effects on the stability of discrete and continuous circulatory systems, *Euromech Colloquium 562*, Sperlonga, Italy, May 24-28 2015.
- [4] Di Nino, S., D'Annibale, F., Luongo, A., A Simple Kinematical Model of Frame-Masonry Shear-Wall Systems, *The Twelfth International Conference on Computational Structures Technology*, Napoli, Italy, September, 2-5 2014.
- [5] D'Annibale, F., Rosi, G., Luongo, A., Bifurcation and stability of piezoelectric controlled systems loaded by follower forces, *Euromech Colloquium 563*, Cisterna di Latina, Italy, March, 17-21 2014.
- [6] D'Annibale, F., Rosi, G., Luongo, A., Bifurcation analysis of nonlinear piezoelectric controlled systems under nonconservative loads, *International Conference on Structural Nonlinear Dynamics and Diagnosis CSNDD 2014*, Agadir, Morocco, May, 19-21 2014.
- [7] D'Annibale, F., Rosi, G., Luongo, A., Bifurcation analysis of a nonlinear piezoelectric beam subjected to combined conservative and nonconservative loads, *The 4th Canadian conference on Nonlinear Solid Mechanics CanCNSM 2013*, Montreal, Canada, July, 23-26 2013.
- [8] D'Annibale, F., Piccardo, G., Luongo, A., A perturbation approach to the nonlinear Generalized Beam Theory, *The 4th Canadian conference on Nonlinear Solid Mechanics CanCNSM 2013*, Montreal, Canada, July, 23-26 2013.
- [9] Luongo, A., D'Annibale, F., Nonlinear bifurcations of damped visco-elastic planar beams under simultaneous gravitational and follower forces, *5th International Conference on Physics and Control PhysCon 2011*, Leon, Spain, September, 5-8 2011.
- [10] Beolchini G.C., Conflitti, G., Contento, A., D'Annibale, F., Di Egidio, A., Di Fabio, F., Fanale, L., Galeota, D., Gattulli, V., Lepidi, M., Potenza, F. (2009). Il comportamento degli edifici della Facoltà di Ingegneria dell'Aquila durante la sequenza sismica dell'Aprile 2009. *XIII Convegno di Ingegneria Sismica ANIDIS*, Bologna, Italy, June 28-July 2 2009.

### NATIONAL

- [1] D'Annibale, F., Ferretti, M., Luongo, A., A minimal continuous model for tower-building nonlinear static analysis, *XXIII Congresso Nazionale AIMETA*, Salerno, 4-7 September 2017.
- [2] Ferretti, M., D'Annibale, F., Luongo, A., Buckling and postbuckling analyses of tower-like structures, *XXIII Congresso Nazionale AIMETA*, Salerno, 4-7 September 2017.
- [3] Luongo, A., D'Annibale, F., Linear and nonlinear damping effects on the stability of discrete and continuous circulatory systems, *XXII Congresso Nazionale AIMETA*, Genova, 14-17 September 2015.
- [4] D'Annibale, F., Rosi, G., Luongo, A., Controlling the limit-cycle of the Ziegler column via piezoelectric dampers, *XXII Congresso Nazionale AIMETA*, Genova, 14-17 September 2015.
- [5] Di Nino, S., D'Annibale, F., Luongo, A., Damping modeling of frame-masonry shear-wall system, *XXII Congresso Nazionale AIMETA*, Genova, 14-17 September 2015.
- [6] D'Annibale, F., Luongo, A., Stability and bifurcation of piezoelectric-controlled discrete mechanical systems under nonconservative positional forces, *II Riunione del Gruppo di Dinamica e Stabilità dell'AIMETA GADeS*, Roma, 16-17 October 2014.

- [7] Luongo, A., D'Annibale, F., Depriving the 'damping destabilization paradox' of its fascination, *II Riunione del Gruppo di Dinamica e Stabilità dell'AIMETA GADeS*, Roma, 16-17 October 2014.
- [8] D'Annibale, F., Rosi, G., Luongo, A., Linear stability analysis of piezoelectric controlled beams subjected to nonconservative loads, *XXI Congresso Nazionale AIMETA*, Torino, 17-20 September 2013.
- [9] Luongo, A., D'Annibale, F., Dynamic bifurcation of a visco-elastic beam, *I Riunione del Gruppo di Dinamica e Stabilità dell'AIMETA GADeS*, Roma, 19 October 2012.
- [10] Luongo, A., D'Annibale, F., Dynamic modelling of visco-elastic beams, *XX Congresso Nazionale AIMETA*, Bologna, 12-15 September 2011.
- [11] D'Annibale, F., Luongo, A., Fatigue damage of a discrete elasto-plastic rod under quasistatic frictional contact with wear, *IV Riunione del Gruppo di Meccanica dei Materiali dell'AIMETA GMA 2010*, Palermo, 25-26 February 2010.
- [12] Luongo, A., D'Annibale, F., Linear stability analysis of multiparameter dynamical systems via a numerical-perturbation approach, *XIX Congresso Nazionale AIMETA*, Ancona, 14-17 September 2009.

## EDITORIAL POSITIONS

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- Member of the Editorial Board of the *American Journal of Mechanical and Industrial Engineering*, Science Publishing Group.
- Issue Editor of the S.I. 'Nonlinearities, Bifurcation and Instabilities', *Continuum Mechanics and Thermodynamics*, **27**(4-5), 2015.

## PARTICIPATION IN RESEARCH PROJECTS

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- PRIN 2007, Title of the project: *Modelli analitici e sperimentali per l'analisi dinamica e di stabilità delle strutture nonlineari*, Scientific Coordinator: Prof. Fabrizio Vestroni, Financed by the Italian Ministry of Education, University and Research.
- PRIN10-11, Title of the project: *Dinamica stabilità e controllo di strutture flessibili*, Scientific Coordinator: Prof. Angelo Luongo, Financed by the Italian Ministry of Education, University and Research.

## TEACHING EXPERIENCES

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### COURSES

- Academic year 2015-16, first semester: Professor with a temporary appointment of *Mechanics of structures* for Bachelor's students in Industrial Engineering - 60 hours (University of L'Aquila).
- Academic year 2016-17, first semester: Professor with a temporary appointment of *Mechanics of structures* for Bachelor's students in Industrial Engineering - 60 hours (University of L'Aquila).
- Academic year 2017-18, first semester: Professor of *Mechanics of structures* for Bachelor's students in Industrial Engineering - 60 hours (University of L'Aquila).
- Academic year 2017-18, second semester: Professor with a temporary appointment of *Stability of Structures* for Master's students in Mechanical Engineering - 20 hours (Warsaw University of Technology).

## EXERCISES

- Academic year 2005-06, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 20 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2006-07, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 20 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2007-08, first semester: Exercises of *Mechanics of Structures* for Master's students in Construction-Architectural Engineering - 10 hours (University of L'Aquila, tenured professor: Prof. Angelo Di Egidio).
- Academic year 2007-08, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 20 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2008-09, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 20 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2009-10, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 20 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2010-11, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 20 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2011-12, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 20 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2012-13, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 30 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2013-14, second semester: Exercises of *Mechanics of Structures* for Bachelor's students in Civil Engineering - 30 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2014-15, first semester: Exercises of *Bridge Construction* for Master's students in Civil Engineering - 30 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2015-16, first semester: Exercises of *Bridge Construction* for Master's students in Civil Engineering - 30 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2016-17, first semester: Exercises of *Bridge Construction* for Master's students in Civil Engineering - 30 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).
- Academic year 2017-18, first semester: Exercises of *Bridge Construction* for Master's students in Civil Engineering - 30 hours (University of L'Aquila, tenured professor: Prof. Angelo Luongo).

## REVIEWER FOR INTERNATIONAL JOURNALS

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- Nonlinear Dynamics
- International Journal of Non-Linear Mechanics
- Archive of Applied Mechanics

- Meccanica
- Mathematics and Mechanics of Solids
- Continuum Mechanics and Thermodynamics
- Shock and Vibration
- International Journal of Mechanical Sciences
- Mathematical Reviews

## **PARTICIPATION IN RESEARCH GROUPS AND AFFILIATION AT SCIENTIFIC ASSOCIATIONS**

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### **RESEARCH GROUPS**

- Member of the International Research Center on Mathematics and Mechanics of Complex Systems (M&MoCS), University of L'Aquila
- Member of the Laboratoire International Associé Coss&Vita, established by the laboratories of the Fédération Francilienne de Mécanique, Matériaux, Structures et Procédés (F2M) and of the International Research Center on Mathematics and Mechanics of Complex Systems (M&MoCS)

### **INTERNATIONAL SCIENTIFIC ASSOCIATIONS**

- EUROMECH

### **NATIONAL SCIENTIFIC ASSOCIATIONS**

- SISCO - Società Italiana di Scienza delle Costruzioni
- AIMETA - Associazione Italiana di Meccanica Teorica e Applicata
- GADeS - Gruppo AIMETA di Dinamica & Stabilità

## **ORGANIZATION OF CONFERENCES**

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- Stability Identification and Control - Sicon, TC1 Event, L'Aquila, Italy, July 2-6 2007.
- Euromech Colloquium 562, Sperlonga, Italy, May 24-28 2015.