

Valentina Balbi

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Employment and Education

- Since Jan 2021** **Lecturer in Applied Mathematics (Galway University Foundation)**
School of Mathematics, Statistics and Applied Mathematics,
NUI Galway, Ireland
- June 2019-Dec 2020** **Lecturer in Industrial and Applied Mathematics**
Department of Mathematics and Statistics,
University of Limerick, Ireland
- Mar2017 – Feb2019** **Marie Curie Research Fellow**
NUI Galway, Ireland
funded by the *European Commission* under the *H2020 programme*
Mentor: Professor Michel Destrade
- Feb 2016 – Feb 2017** **Research Associate**
University of Manchester, UK
funded by *Engineering and Physical Sciences Research Council*
Supervisor: Professor William J. Parnell
- Nov 2015 – Jan 2016** **Research Assistant**
NUI Galway, Ireland
funded by *Enterprise Ireland, Ireland*
Supervisor: Professor Michel Destrade
- Sep 2012 – Sep 2015** **PhD in Theoretical Mechanics of Solids**
Institut Jean le Rond D’Alembert, UPMC – Paris 6, France
funded by *Ministère de l’éducation nationale, de l’enseignement supérieur et de la recherche, France*. Supervisor: Professor Pasquale Ciarletta
- Dec 2014 – Apr 2015** **Visiting Researcher**
Feb – Mar 2014 MOX (Modeling & Scientific Computing), Politecnico di Milano, Italy
funded by *Progetto di Start-up Packages e programma di PhD dal titolo Mathematical Modeling of Nanoscale Therapeutic Systems*.
Supervisor: Professor Davide Ambrosi
- Oct – Dec 2013** **Visiting Researcher**
Mar – Apr 2013 Living Matter Lab, Stanford University, California
funded by *France Stanford Center for Interdisciplinary Studies*.
Supervisor: Professor Ellen Kuhl
- 2010 – 2012** **MSc in Mathematical Modeling in Engineering**
Department of Mathematical Sciences, Politecnico di Torino, Italy

Mar – Sep 2012

Visiting Student

Institut Jean Le Rond D'Alembert, UPMC – Paris 6, France
funded by *Mobilità Tesi su Proposta, Politecnico di Torino*
Master thesis project: *Stability analysis of growing soft tubular tissues*

2006 – 2010

BSc in Mathematics for Engineering

Department of Mathematical Sciences, Politecnico di Torino, Italy
Bachelor thesis project: *Application of the Microwave Imaging to the study of soft and hard tissues*

Publications in Peer-Reviewed International Journals

- 2020 M. Righi, **V. Balbi** *Foundations of viscoelasticity and application to soft tissues mechanics*, Chapter submitted to Nečas Center Series.
- 2020 **V. Balbi**, M. Destrade, A. Goriely *The mechanics of human brain organoids*, doi:10.1103/PhysRevE.101.022403.
Physical Review E [Impact Factor 2019: 2.296].
- 2019 **V. Balbi**, A. Trotta, M. Destrade, A. Ní Annaidh *Poynting effect of brain matter in torsion*, DOI: 10.1039/C9SM00131J.
Soft Matter [Impact Factor 2019 = 3.14; Rank in “Condensed Matter” journals = 34th/389].
- 2018 **V. Balbi**, T. Shearer, W.J. Parnell, *A modified formulation of quasi-linear viscoelasticity for transversely isotropic materials under finite deformation*. DOI: 10.1098/rspa.2018.0231.
Proc Roy Soc A [Impact Factor 2019 = 2.74; Rank in “Multidisciplinary Sciences” = 18th/64].
- 2016 **V. Balbi**, P. Ciarletta. *Mathematical Modeling of Morphogenesis in Living Materials*. Chapter in *Mathematical Models and Methods for Living Systems*. Springer International Publishing, 2016. 211-274.
- 2015 **V. Balbi**, E. Kuhl, P. Ciarletta. *Morphoelastic control of gastro-intestinal organogenesis: Theoretical predictions and numerical insights*. doi: 10.1016/j.jmps.2015.02.016
J Mech Phys Solids [Impact Factor 2019 = 4.35; Rank in “Mechanics” journals = 12th/67; Google Scholar citations: 38].
- 2014 **V. Balbi**, P. Ciarletta. *Helical buckling of thick-walled, pre-stressed, cylindrical tubes under a finite torsion*. **Invited contribution, Special issue in honor of RW Ogden** doi:10.1177/1081286514550570
Math and Mech Solids [Impact Factor 2019 = 1.96; Rank in Mathematics, Interdisciplinary Applications = 19th/103; Google Scholar citations: 13].

P. Ciarletta, **V. Balbi**, E. Kuhl. *Pattern selection in growing tubular tissues*. doi: 10.1103/PhysRevLett.113.248101
Phys Rev Letters [Impact Factor 2019 = 8.385; Rank in “Physics” journals = 6th/78; Google Scholar citations: 83].
- 2013 **V. Balbi**, P. Ciarletta. *Morpho-elasticity of intestinal villi*.
J Roy Soc Interface doi:10.1098/rsif.2013.0109
[Impact Factor 2019 = 2.647; Rank in “Multidisciplinary Sciences” = 13th/64; Google Scholar citations: 42].

Funding & Awards

Sept 2019	“Mathematical modelling of Sound Bounce: a new acoustic meta-material”, €118, 000, funded by Restored Hearing Ltd, PI.
May 2018	“Progetti Giovani GNFM 2019”, €4, 000, Gruppo Nazionale per la Fisica Matematica, co-Investigator (PI: Dr Chiara Giverso).
Apr 2016	Postdoctoral Fellowship, €95, 000, Irish Research Council , PI [Declined].
Jan 2016	Marie Curie Individual Fellowship, €175, 800, European Commission , PI
Jan 2016	PostDoctoral Research Associate position, £30, 900, EPSRC, co-Investigator (PI: William J Parnell)
Nov 2015	Research assistant position, €8, 600, Enterprise Ireland, co-Investigator (PI: Michel Destrade)
Sept 2014	Travelling Award, €500 <i>Fondazione CIME Roberto Conti</i> , PI
2012 – 2013	Collaborative Project, \$15, 000, <i>France-Stanford Center for Interdisciplinary Studies</i> , co-Investigator (PIs: P. Ciarletta and E. Kuhl).
Oct 2012	PhD grant, €61, 800, <i>French government</i> , PI
Mar 2012	Travelling Award, €2, 760, Politecnico di Torino, PI.

Teaching and Supervision

Feb 2020	Invited lecturer at the Doctoral school “Modelling of Biomaterials”. Lectures topic: Mechanics of soft tissues, Kacov, Czech Republic.
Sept 2019 – Dec 2020	Lecturer in Linear Algebra 1 (module MS4131), first-year undergraduate level; class size: 150 students, Lecturer in Advanced Methods I (module MS6011), postgraduate level (MSc in Mathematical Modelling); class size: 11 students, Department of Mathematics and Statistics, University of Limerick, Limerick, Ireland.
Sept – Dec 2018	Lecturer in Nonlinear Elasticity (advanced module MP410), fourth- and third-year undergraduate, postgraduate (structured PhD in physics, engineering and applied mathematics) level; class size: 45 students. School of Mathematics, Statistics and Applied Mathematics, National University of Ireland Galway, Galway, Ireland.
Sept – Dec 2016	Teaching Assistant in Calculus and Vectors B, first-year undergraduate level, class size: 12 students. School of Mathematics, University of Manchester, UK.

So far I have supervised 7 Masters students, 2 Undergraduate students, 1 postdoctoral researcher.

Press coverage

July 2019	My article “Poynting effect of brain matter in torsion” is highlighted in the <i>Irish independent, Irish tech news, Galway Daily, Irish Examiner</i> .
May 2019	<i>I'm still standing: 130 years of the Eiffel Tower</i> , written by myself and Michel Destrade and published in RTE Brainstorm .
May 2018	<i>Exploring the hidden black holes at the centre of our galaxy</i> , written by myself and Michel Destrade and published in RTE Brainstorm .
Feb 2018	<i>Scientists battle it out for FAMELAB success tonight</i> , published in <i>The Galway advertiser</i> .

- July 2017** *Artificial skin could allow robots to feel like we do*, published in *Horizon: the EU Research & Innovation magazine*.
- Apr 2016** *Computing the Gut*, published in *Biomedical computation Review*.
- Dec 2014** My article [Ciarletta, Balbi, Kuhl. Pattern selection in growing tubular tissues. *Phys Rev Letters* 113:248101, 2014] is selected by *APS Physics* as *Synopsis: Getting the Wrinkles Out*.

Conference Proceedings

- 2013** **V. Balbi**, P. Ciarletta. *Morphoelasticity of intestinal villi*. In **21ème Congrès Français de Mécanique**, Bordeaux, France (FR)
- 2009** G. Pagana, N. Pugno, **V. Balbi**, E.A. Attardo, G. Vecchi. *New targets for microwave imaging*. In **Nanoscience & Nanotechnology**, Frascati, Italy (IT)

Selected Conferences

- June 2021** Minisymposium on “Soft tissue biomechanics: From experiments to mathematical modelling”, Italian Society of Applied and Industrial Mathematics (SIMAI), Parma, Italy -**Organiser**
- September 2019** Irish Mathematics Society meeting, NUI Galway, Ireland – **Invited talk**
- July 2019** The Multiscale Spectrum of Constitutive Modeling in Solid Mechanics, Castro Urdiales, Spain – **Invited talk & chair**
- June 2019** Maths from the body II, Venice, Italy – **Invited talk & chair**
- March 2019** Oberwolfach miniworkshop on *Mathematical Aspects of Nonlinear Wave Propagation in Solid Mechanics*, **Mathematisches Forschungsinstitut Oberwolfach** (MFO), Germany – **Invited talk**
- July 2018** 10th European Solid Mechanics Conference, Bologna, Italy – Invited talk to the symposium *Nonlinear Elasticity*
- Sept 2017** INdAM Meeting Mathematical Physics of Living Systems, Cortona, Italy – Invited talk
- June 2017** International Workshop on Modelling of Nonlinear Continua, Castro Urdiales, Spain – **Invited talk & chair**
- Jul 2015** 9th European Solid Mechanics Conference, Madrid, Spain – Talk
- Aug 2013** Congrès Français de Mécanique, Bordeaux, France – Talk
- Mar 2013** Living Matter Lab, Stanford University, California – Invited talk

Scientific activity

- 2019** **Guest editor**, Special Issue on “Constitutive modelling in biomechanics”, *International Journal of nonlinear mechanics*.
- March 2018** Minisymposium on “Constitutive modelling in biomechanics”, British Applied Mathematics Colloquium, St Andrews, UK – **Organiser**
- Sept 2016** Soft tissue workshop: “Constitutive behaviour of soft tissues: connecting experimental and modelling perspectives”, Manchester, UK – Oral presentation and **Organiser**

2015 – present

Reviewer for: Proceeding of the Royal Society London A, Journal of Engineering Mathematics, Journal of the Mechanics and Physics of Solids, SIAM Journal on Applied Mathematics, Biomechanics and Modeling in Mechanobiology, Mathematical Methods in the Applied sciences, Physical Review E.

Outreach activities

Sept 2019 – Dec 2019 **Young Modellers project**, (role: academic supervisor). I worked with the transition year students to explore how to model real-world problems using maths and stats.

March 2018 FameLab Galway, talk title : "The invisible universe", Ireland

Feb 2018 Middle School Lectures (9h), Convitto Nazionale Umberto Primo, Torino, Italy

March 2016 Big Bang Fair 2016, Birmingham, UK