Curriculum vitae of Riccardo De Pascalis

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Manchester, UK

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Current Position

2010-pr Research Associate in the School of Mathematics - University of Manchester (UK). My main research concerns a EPSRC-funded project: *The influence of nonlinear pre-stress on wave propagation through viscoelastic composites.*

Education

2012 *Teaching for Researchers* training (16 February - 07 June). This course was provided by researcher Development in the faculty of Engineering and Physical Sciences (Univ. of Manchester), and was for post-doctoral research staff involved with university teaching[1].

2010 joint PhD, in Mathematics at Università del Salento (Italy) and in Mechanics at Université Pierre et Marie Curie (France).

[1]This course was integrated with the Professional Standards Framework of the Higher Education Academy, and will be entering the HEA accreditation process at level 1.

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2007 Teacher training specialization (Scuola di specializzazione per l'insegnamento secondario - S.S.I.S.), Università degli Studi di Bari (Italy).

2005 MSc (Laurea magistrale) with honours in Mathematics, Università del Salento (Italy).

2003 BSc (Laurea) with honours in Mathematics, Università del Salento (Italy).

Research interests

Continuum Mechanics: Linear/Nonlinear Elasticity, Linear/Nonlinear viscoelasticity and stability of deformed solids.

Funding

2010-13 Engineering and Physical Sciences Research Council (UK)-funded project

2009 Registration grant, Ecole de Physique des Houches.

2008 Mobility grant of VINCI - Università Italo-Francese (Funding for joint PhD between Italy and France).

2007-10 PhD Fellowship of the University of Salento.

Membership

2007-pr Member of the Italian *Gruppo Nazionale per la Fisica Matematica* (GNFM).

Distinctions

2007 My first doctoral results were on the combined compression, torsion, and helical shear of a thick-walled tube. They were published in [R. De Pascalis, M. Destrade, G. Saccomandi, *The stress field in a pulled cork and some subtle points in the semi-inverse method of nonlinear elasticity*, Proc. Roy. Soc. A, 463: 2945-2959, (2007)]. They have been noticed in *Science* magazine [31/08/07, 317, no 5842, 1151, DOI: 10.1126/science.317.5842.1151a] where the paper has been qualified "a very nice application of the theory of nonlinear elasticity". See also the *Daily Telegraph* [22/08/07] and *La Recherche* [11/07]. Editor of the Proceedings of the Royal Society A, includes our article in a list of "outliers", [Editorial Proceedings of The Royal Society A, January 8, 2010, 466:1-2].

Teaching activity

2012-2013, 2nd semester (University of Manchester), teaching in the supervision class *Calculus and Applications.*

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Computer Skills

Operative Systems: *Linux, Windows.*

Software packages: *LaTeX, Mathematica, Maxima, Maple, Office.*

Languages

Italian: *Mother tongue.*
French: *Conversant.*
English: *Fluent.*

Visits

6-day visit, Mathematics Department at the University of Arizona, USA, to collaborate with Professor A. Goriely, October 2009 (funded by a CNRS/USA grant).

4-day visit, School of Electronic, Electrical and Mechanical Engineering at the University College Dublin, Ireland, to collaborate with Professor M. Destrade, May 2009 (funded by a Marie Curie action and by the Université Pierre et Marie Curie).

6-month stay, Institute d'Alembert, Université Pierre et Marie Curie, Paris (PhD partner university), January-June, 2009.

Conferences as a speaker

2013, June 24th-28th. New Trends in Solid Mechanics: Coupled Fields and Multiscale Modelling, Castro Urdiales, Cantabria, Spain with communication *Modelling inhomogeneous viscoelastomeric materials.*

2012, July 9th-13th. 8th European Solid Mechanics Conference (ESMC 2012) Graz, Austria, with communication *Prediction of the Nonlinear Load and Unload Pressure-Volume Curves of a Complex Microsphere Composite including Buckling Effects.*

2012, May 21th-25th. Seventh GDR Conference: *Wave Propagation in Complex Media for Quantitative and non Destructive Evaluation*, Ile d'Oleron (France), (funded by EPSRC and GDR) with communication *Predicting the pressure-volume curve of an elastic microsphere composite.*

2012, April 27th-29th. British Applied Mathematics Colloquium (BAMC) 2012, University College London (UK), (funded by EPSRC) with communication *Predicting the pressure-volume curve of an elastic microsphere composite.*

2011, August 31st-September 2nd. 2nd International Conference on Material Modelling (ICMM2-incorporating the 12th European Mechanics of Materials Conference), Paris (France) (funded by EPSRC), with communication *Constitutive modelling of a microvoided composite.*

2011, April 11th-13th. British Applied Mathematics Colloquium (BAMC) 2011, University of Birmingham (UK), (funded by EPSRC) with communication *Secondary deformations in nonlinear elasticity: The stress field in a pulled cork.*

2009, May 14th. Irish Society for Scientific & Engineering Computation Symposium, Dublin City University, (funded by a Marie Curie action and by the Université Pierre et Marie Curie) with communication *The stress field in a pulled cork and some subtle points in the semi-inverse method of nonlinear elasticity.*

Workshops to which I have been involved as organizer

2013. June 5-7th. *Advances in applied mathematics and mechanics*, EPSRC funded workshop, Manchester (UK), School of Mathematics, University of Manchester.

Workshops and Summer Schools

Elasticity Day-2012, (One-Day Workshop on Mathematical Modelling in Solid Mechanics), Liverpool (UK), May 5th, 2012, Liverpool University, with communication *Predicting the pressure-volume curve of an elastic microsphere composite.*

XXXIV Scuola Estiva di Fisica Matematica[2], Ravello (Italy), September 14-26, 2009 (funded by Gruppo Nazionale per la Fisica Matematica (GNFM)). Presented a talk with the title *Stroh Formalism and Nonlinear Euler Buckling.*

École de Physique des Houches, *New trends in physics and mechanics of biological systems*, Session XCII, Les Houches (France), July 06-31, 2009 (Funded by Les Houches School of Physics and Università Italo-Francese). Presented a project work on the paper: Coleman, B. D., Tobias, I., Swigon, D., *Theory of the influence of end conditions on self-contact in DNA loops*, J. Chem. Phys, 103 (20), (1995).

XXXIII Scuola Estiva di Fisica Matematica, Ravello (Italy), September 08-20, 2008 (funded by Gruppo Nazionale per la Fisica Matematica (GNFM)). Presented a talk with the title *Weak anchoring Freedericksz' transition.*

[2]Italian Mathematical-Physics Summer School

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XXXII Scuola Estiva di Fisica Matematica, Ravello (Italy), September 10-22, 2007 (funded by Gruppo Nazionale per la Fisica Matematica (GNFM)). Presented a talk with the title *Sui Semigruppi dell'Equazione del Calore*.

Summer courses organized by "Scuola Matematica Interuniversitaria", Perugia (Italy), July 30 - August 31, 2007 (funded by Scuola Matematica Interuniversitaria and Università del Salento).

8th international Internet Seminar on *Analytic Semigroups and Reaction-Diffusion Problems*, 2004-2005, with final workshop in Casalmaggiore (Italy), June 05-11, 2005 (funded by German-Italian Consortium "International School on Evolution Equations" and Università del Salento). Presented a talk with the title *Further maximum Principles of Elliptic and Parabolic type.*

7th international Internet Seminar on *Operator Semigroups and Applications*, 2003-2004, with final workshop in Blaubeuren, (Germany), June 13-16, 2004 (funded by German-Italian Consortium "International School on Evolution Equations" and Università del Salento). Presented a talk with the title *Solvability of semilinear Evolution equations.*

6th international Internet Seminar on *Operator Matrices and Delay Semigroups*, 2002-2003, with final workshop in Blaubeuren (Germany), June 16-23, 2003 (funded by German-Italian Consortium "International School on Evolution Equations" and Università del Salento). Presented a talk with the title *Wave equations with delay.*

Publications

A. International journals

[A4] R. De Pascalis, I. D. Abrahams and W. J. Parnell, *Predicting the pressure-volume curve of an elastic microsphere composite*, Journal of the Mechanics and Physics of Solids, Volume 61, Issue 4, Pages 1106-1123, ISSN 0022-5096, 10.1016/j.jmps.2012.11.005, (2013).

[A3] De Pascalis, R., Destrade, M., Goriely, A., *Nonlinear correction to the Euler buckling formula for compressible cylinders*, Journal of Elasticity, 102(2): 191–200 (2010).

[A2] De Pascalis, R., Rajagopal, K. R., Saccomandi, G., *Remarks on the use and misuse of the semi-inverse method in the nonlinear theory of Elasticity*, Quarterly Journal of Mechanics and Applied Mathematics, 62 (4): 451–464 (2009).

[A1] De Pascalis, R., Destrade, M., Saccomandi, G., *The stress field in a pulled cork and some subtle points in the semi-inverse method of nonlinear elasticity*, Proceedings of The Royal Society of London. Series A. Mathematical, Physical and Engineering Sciences, 463 (2087): 2945–2959 (2007).

B. Submitted papers

Papers C8, C7, C1 are ready for an imminent submission.

C. In preparation

[C8] R. De Pascalis, I. D. Abrahams and W. J. Parnell, *A new interpratation on the quasilinear model of viscoelasticity*, in preparation for submission to Proceedings of The Royal Society of London. Series A.

[C7] R. De Pascalis, *Some large quasilinear viscoelastic deformations of isotropic material: results for pure radial, pure torsion and simple shear in the quasistatic theory*, in preparation for submission to International Journal of Non-Linear Mechanics.

[C6] R. De Pascalis, I. D. Abrahams and W. J. Parnell, *A quasilinear visco incompressible hollow sphere under hydrostatic load.*

[C5] I. D. Abrahams, Jean-Marc Allain, R. De Pascalis, Barbara Lynch, and W. J. Parnell, *Modelisation of a tendon submitted to cyclic loading*, in preparation for submission to Journal of Biomechanics.

[C4] R. De Pascalis, I. D. Abrahams and W. J. Parnell, *Viscoelastic waves in prestressed nonlinear composite bars. Band-gap tuning and effective relaxation functions*, in preparation for submission to Int. J. Solids Structures.

[C3] R. De Pascalis, I. D. Abrahams and W. J. Parnell, *Microsphere interactions with pressure-volume load and unload curve predictions.*

[C2] I. D. Abrahams, R. De Pascalis, W. J. Parnell and M. Thorpe, *SCM and GSCM to predict the critical pressure for a complex microsphere composite.*

[C1] R. De Pascalis, G. Napoli, S. S. Turzi, *Elastica confined in a circular domain: adhesion by curvature and elasto-capillarity*, in preparation for submission to Physica D: Nonlinear Phenomena.

D. PhD Thesis

[D1] De Pascalis, R., *The Semi-Inverse Method in solid mechanics: Theoretical underpinnings and novel applications*, PhD Thesis, Dipartimento di Matematica, Università del Salento, Italy / Institute Jean Le Rond d'Alambert, Université Pierre et Marie Curie, France, December 2010

E. Graduate Thesis

[E2] De Pascalis, R., *Semigruppi di Markov in* $\mathbb{R}^N$, MSc Thesis, Dipartimento di Matematica, Università del Salento, Italy, July 2005.

[E1] De Pascalis, R., *Il teorema dell'Applicazione Conforme di Riemann*, BSc Thesis, Dipartimento di Matematica, Università del Salento, Italy, October 2003.

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