

CONTACT INFORMATION	<p>School of Mathematics The University of Manchester Oxford road Manchester M13 9PL</p> <p>Cell: 07518027295 E-mail: arturgower@gmail.com Website: arturgower.github.io</p>
RESEARCH	Wave scattering & propagation, solid mechanics, and optimisation.
PROGRAMMING	Julia, Mathematica, C, C++, Matlab, Bash, and T _E X (L ^A T _E X, B _I B _T E _X , TikZ).
ACADEMIC HISTORY	<p>University of Manchester, UK</p> <p>Research associate, Applied Mathematics 10/2015 – 09/2018</p> <ul style="list-style-type: none"> • Ultrasonic propagation in complex media - EPSRC (EP/M026205/1) • Responsible for mathematical modelling and numerical implementation. Strong ties with experiments (EP/M026310/1) and simulations (EP/M026302/1). <p>NUI Galway, Ireland</p> <p>Ph.D., Applied Mathematics 09/2011 – 09/2015</p> <ul style="list-style-type: none"> • Thesis Topic: <i>Nonlinear Modelling of Soft Matter: Waves, Growth, Instabilities, constitutive laws.</i> • Adviser: Professor Michel Destrade <p>University of Campinas, Brazil (QS 2nd best university in Latin America)</p> <p>M.Sc. grade: 96% Applied Mathematics, Computational geophysics group 03/2009 – 05/2011</p> <ul style="list-style-type: none"> • Thesis Topic: <i>Nonlinear Elasticity with Radial Symmetry</i> • Adviser: Assoc. Prof. Lucio Tunes dos Santos • Area of Study: Continuum Mechanics and Numerical Analysis • Candidacy Exams in <i>Linear Algebra, Functional Analysis, \mathbb{R}^n Analysis</i> <p>B.Sc. grade: 83% Applied Mathematics 03/2005 – 12/2008</p> <ul style="list-style-type: none"> • Emphasis on Theoretical Mechanics with Minor in Computer Science • Thesis Topic 1: <i>Introduction to Discrete Chaotic Dynamics</i> • Thesis Topic 2: <i>Wave Reflection through Kirchhoff Modelling</i>
TEACHING EXPERIENCE	<p>Qualification</p> <p>Teaching and learning course - (5 ECTS) NUI Galway 2013</p> <p>University of Manchester</p> <p><i>Tutorials</i> 09/2015 - 06/2018</p> <ul style="list-style-type: none"> • Lead problem solving on calculus, linear algebra, complex analysis to B.Sc. mathematics and B.Sc. engineering. • Grade and give feedback on weekly assignments. <p><i>Supervision</i> 09/2015 - 06/2018</p> <ul style="list-style-type: none"> • Final year undergraduate projects, summer interns, and assist PhD students.

NUI Galway

Tutorials and lectures

09/2014 - 06/2015

- Teach tutorials, and occasional lectures, on Fluid Mechanics and Nonlinear Elasticity to final year B.Sc. mathematics.
- Grade and give feedback on weekly assignments.

Tutorials

09/2011 - 06/2014

- Lead problem solving on vector calculus, mathematical modelling, linear algebra, mathematical methods to B.Sc. engineering, physics and mathematics.
- Grade exams and give in class feedback.

Drop-in centre

03/2012 - 11/2014

- Teach at the centre for the Support for Undergraduate Mathematics (SUMS).

University of Campinas

Lectures

02/2010 - 07/2010

- Course on linear algebra and analytic geometry to B.Sc. engineering.
- Prepare lectures, write and grade exams.

Pas Facamp (Charity)

07/2009 - 09/2009

- Teach basic finance to local community.

FUNDING

EPSRC, Postdoctoral Fellowship (unsuccessful rank 7/35) **2018**

Title: Predicting the properties of particulate materials from backscattered waves

Principal Investigator: Artur L Gower

Funding Value: N/A

Irish Research Council, PhD fellowship

09/2013 - 09/2015

Title: Nonlinear Modelling of soft matter

Principal Investigators: Artur L Gower & Michel Destrade

Funding Value: k€46

Hardiman Scholarship, PhD fellowship

09/2011 - 09/2013

Title: Skin deep, the mechanics of skin through the formation of wrinkles

Principal Investigators: Artur L Gower & Michel Destrade

Funding Value: k€42

Brazilian National Council for Scientific and Technological Development,

MSc fellowship - (I ranked 1st for this fellowship)

02/2009 - 03/2011

Title: nonlinear elastodynamics with radial symmetry

Principal Investigator: Artur L Gower

Funding Value: kR\$29

Sao Paulo Research Foundation Undergraduate Research Scholarship

Title: Acoustic diffraction with Kirchhoff modelling

03/2007 - 02/2008

Principal Investigator: Artur L Gower & Lucio T Santos

Funding Value: kR\$6

Title: introduction to discrete chaotic dynamics

03/2006 - 02/2007

Principal Investigator: Artur L Gower & Lucio T Santos

Funding Value: kR\$6

RECENT
SOFTWARE

- [S3] A.L. Gower and J. Deakin. A Julia library for simulating, processing, and plotting multiple scattering of waves. [MultipleScattering.jl](#), MIT License.
- [S2] A.L. Gower. A Julia library to calculate the effective wave reflection and transmission in material random materials. [EffectiveWaves.jl](#), MIT License.
- [S1] A.L. Gower. A Mathematica package that uses the concept of entropy maximisation to calculate the influence on a GO board. [EntropyGO](#), MIT License.

PRE-PRINTS

- [14] V.J. Pinfield, D.M. Forrester, A.L. Gower, W.J. Parnell, I.D. Abrahams, Thermo-viscoacoustic scattering by a spherical particle: comparison of analytical and finite element models, *submitted*

REFEREED
JOURNAL
PAPERS

Total citations: 131, according to [my Google Scholar](#).

- [13] A.L. Gower, R.M. Gower, J. Deakin, W.J. Parnell, I.D. Abrahams, Characterising particulate random media from near-surface backscattering: A machine learning approach to predict particle size and concentration, *EPL (Europhysics Letters)*, (2018) 122 (5), 54001
- [12] A. L. Gower, M.J. A. Smith, W.J. Parnell, I.D. Abrahams, Reflection from a multi-species material and its transmitted effective wavenumber, *Proceedings of the Royal Society A*, (2018) 2017.0864
- [11] A. Agosti, A. L. Gower, P. Ciarletta, The constitutive relations of initially stressed incompressible Mooney-Rivlin materials, *Mechanics Research Communications*, (2017) 2017.11.002.
- [10] A. L. Gower, T. Shearer, P. Ciarletta, A new restriction for initially stressed elastic solids, *Quarterly Journal of Mechanics and Applied Mathematics*, 70 (2017) p.455-478.
- [9] M. Carfagna, M. Destrade, A. L. Gower, A. Grillo, Oblique wrinkles, *Philosophical Transactions of the Royal Society A*, Invited contribution to the themed Issue on Patterning through instabilities in complex media, 375 (2017) 2016.0158.
- [8] P. Ciarletta, M. Destrade, A.L. Gower, M. Taffetani, Morphology of residually stressed tubular tissues: beyond the elastic multiplicative decomposition, *Journal of the Mechanics and Physics of Solids*, 90 (2016) p.242-253.
- [7] P. Ciarletta, M. Destrade, A.L. Gower, On residual stresses and homeostasis: an elastic theory of functional adaptation in living matter, *Scientific Reports*, 6 (2016) 24390.
- [6] R.M. Gower, A.L. Gower, High order reverse automatic differentiation with emphasis on the third order, *Mathematical Programming SERIES A*, 155 (2016) p.81-103.
- [5] A.L. Gower, P. Ciarletta, M. Destrade, Initial stress symmetry and its application in elasticity, *Proceedings of the Royal Society A*, 471 (2015) 2015.0448.
- [4] A.L. Gower, Connecting the material parameters of soft fibre-reinforced solids with the formation of surface wrinkles, *Journal of Engineering Mathematics*, Special Issue on Fiber-Reinforced Materials, 95 (2015) p. 217-229.
- [3] D.R. Nolan, A.L. Gower, M. Destrade, R.W. Ogden, J.P. McGarry, A robust anisotropic hyperelastic formulation for the modelling of soft tissue, *Journal of the Mechanical Behavior of Biomedical Materials*, 39 (2014) p.48-60.
- [2] A.L. Gower, M. Destrade, R.W. Ogden, Counter-intuitive results in acousto-elasticity, *Wave Motion*, Special Issue in Honour of V.I. Alshits [invited contribution], 50 (2013) p.1218-1228.

- [1] P. Ciarletta, M. Destrade, A.L. Gower, Shear instability in skin tissue, *Quarterly Journal of Mechanics and Applied Mathematics*, 66 (2013) p.273-288.

OTHER PAPERS

- [6a] A.L. Gower, Chapter: Generating feasible solutions: part 1, In: Automatic Optimised Design of Umbilicals (ESGI 100), *MIIS Eprints Archive*, 710 (2016)
- [3a] A.L. Gower, Chapter: Elimination of errors from track line detection, In: Train Positioning Using Video Odometry (ESGI 116), *MIIS Eprints Archive*, 672 (2014)
- [1a] A.L. Gower, Detecting Geometric Faults from Measured Data (ESGI 85), *MIIS Eprints Archive*, 659 (2012)

ACADEMIC SERVICES

Reviewer:

Proceedings of the Royal Society A | *International Journal of Non-Linear Mechanics* | *IMA Journal of Applied Mathematics* | *SIAM Journal of Applied Mathematics* | *ZAMP* (Journal of Applied Mathematics and Physics) | *Journal of the Acoustical Society of America* | *Acta Acustica United with Acustica*

OUTREACH

- [Science Showdown! *How can we measure the invisible: the mathematics of jiggly waves*](#). An event promoting science to a wider audience in Manchester. **03/2017**
- Science Experience Workshop: once a year, for a few open days, I gave maths puzzles and showed videos from research to high school students. **2011 - 2017**
- Maths Enrichment: Teach two morning sessions preparing students for the Irish and international mathematics Olympiad. **2014**
- School Presentation for the School of Science: Two school visits to engage with students about studying science at university. **2011**

EVENTS ORGANIZED

- [Acoustics early career summer school](#), 6-9 Aug 2018 (*Co-organizer*)
A workshop to train early career acousticians in career development, public speaking, writing for the general public and industry collaboration.
- [Constitutive behaviour of soft tissues: connecting experimental and modelling perspectives](#), 31 Aug-2 Sep 2016 (*Co-organizer*)
A workshop to establish the state-of-the-art in constitutive behaviour of soft tissue.
- [Joint Symposium: Irish Mechanics Society and Irish Society for Scientific Engineering & Computation \(ISSEC\)](#), 8-9th of December 2014 (*Co-organizer*)
An annual international mechanics conferences.
- [The First Irish Applied Mathematics Research Students' Meeting](#), 11th of December 2014 (*Co-organizer*)
Organized by the first SIAM student chapter of Ireland, this meeting brought together postgraduates working in applied mathematics.
- [Stokes Modelling Workshop](#), 23rd-26th of June 2014 (*Co-organizer*)
A four-day undergraduate modelling workshop, in the same style as the ESGI.

RECENT TALKS

- [Bremen Workshop on Light Scattering 2018](#), Characterising particulate random media from near-surface backscattering, Bremen, Germany, Mar 2018
- Meeting of the Acoustical Society of America, 141 (5), 3810-3810, *Characterizing composites with acoustic backscattering: Combining data driven and analytical methods*, Boston, USA, Jun 2017
- New mathematics for a safer world: wave propagation in heterogeneous materi-

als, *Characterising random composites with acoustic backscattering*, International Centre for Mathematical Sciences (ICMS), Edinburgh, UK, Jun 2017

- Constitutive behaviour of soft tissues: connecting experimental and modelling perspectives, *Constitutive modelling of initially stressed elastic solids*, Manchester, UK, Sep 2016