

CONTACT INFORMATION	<p>School of Mathematics The University of Manchester Oxford Road Manchester M13 9PL</p>		<p>Cell: 07518027295 E-mail: <a href="mailto:arturgower@gmail.com">arturgower@gmail.com</a> Website: <a href="http://arturgower.github.io">arturgower.github.io</a></p>
RESEARCH INTERESTS	Wave propagation, random media, solid mechanics, and supervised machine learning.		
PROGRAMMING	Julia, Mathematica, C, C++, Matlab, Bash, and T <sub>E</sub> X (L <sup>A</sup> T <sub>E</sub> X, B <sub>I</sub> B <sub>T</sub> E <sub>X</sub> , TikZ).		
ACADEMIC HISTORY	<p><b>University of Manchester</b>, UK</p> <p>Research associate, Applied Mathematics <span style="float: right;">10/2015 – present</span></p> <ul style="list-style-type: none"> <li>• <i>Ultrasonic propagation in complex media</i> - EPSRC (EP/M026205/1)</li> <li>• Responsible for mathematical modelling and numerical implementation. Strong ties with experiments (EP/M026310/1) and simulations (EP/M026302/1)</li> </ul> <p><b>NUI Galway</b>, Ireland</p> <p>Ph.D. Applied Mathematics <span style="float: right;">09/2011 – 09/2015</span></p> <ul style="list-style-type: none"> <li>• Thesis title: <i>Incremental elastic surface waves and static wrinkles</i></li> <li>• Supervisor: Prof. Michel Destrade</li> </ul> <p><b>University of Campinas</b>, Brazil (QS 2nd best university in Latin America)</p> <p>M.Sc. Applied Mathematics, Grade 96% <span style="float: right;">03/2009 – 05/2011</span></p> <p>Computational geophysics group</p> <ul style="list-style-type: none"> <li>• Thesis: <i>Nonlinear Elasticity with Radial Symmetry</i></li> <li>• Emphasis in wave scattering and propagation in Geophysics.</li> </ul> <p>B.Sc. Applied Mathematics, Grade 83% <span style="float: right;">03/2005 – 12/2008</span></p> <ul style="list-style-type: none"> <li>• Emphasis on Mechanics with a minor in Computer Science</li> </ul>		
TEACHING EXPERIENCE	<p><b>Qualification</b></p> <p>Teaching and learning course - (5 ECTS) NUI Galway <span style="float: right;">2013</span></p> <p><b>University of Manchester</b></p> <p><i>Supervision</i></p> <ul style="list-style-type: none"> <li>• Informal Ph.D supervisor, Erik Garcia Neefjes, working on thermo-visco-elastic waves. Erik is on track to complete his PhD on time. <span style="float: right;">09/2017 – present</span></li> <li>• Final year undergraduate on <i>Acoustic Scattering from Cylinders</i>. Janni Harju compared multiple scattering theory with numerical software. <span style="float: right;">2018</span></li> <li>• Summer intern <i>Modelling the Bladder using Non-Linear Elasticity</i>. Imagining the bladder as a rubber material, Farid Hounat found the optimal material to sustain varied internal fluid pressure. <span style="float: right;">2017</span></li> <li>• Summer intern <i>Using elastic waves to measure initial stress</i>. Sara Ilhac related bulk wave speeds with directions of tension. <span style="float: right;">2016</span></li> </ul> <p><i>Tutorials</i> <span style="float: right;">09/2015 – 06/2018</span></p> <ul style="list-style-type: none"> <li>• Led problem solving classes on calculus, linear algebra, complex analysis for B.Sc. mathematics and B.Sc. engineering 1st to 2nd year students.</li> <li>• Marked and provided constructive feedback on weekly assignments.</li> </ul>		

## NUI Galway

### *Tutorials and lectures*

**09/2014 – 06/2015**

- Taught tutorials, and occasional lectures, on Fluid Mechanics and Nonlinear Elasticity to final year B.Sc. mathematics students.
- Marked and provided constructive feedback on weekly assignments.

### *Tutorials*

**09/2011 – 06/2014**

- Led problem solving classes on vector calculus, mathematical modelling, linear algebra, mathematical methods for B.Sc. mathematics and engineering.
- Marked exams and gave in class feedback.

### *Drop-in centre*

**03/2012 – 11/2014**

- Taught at the centre for the [Support for Undergraduate Mathematics](#).

## University of Campinas

### *Lectures*

**02/2010 – 07/2010**

- Lectured on Linear Algebra to B.Sc. engineering 1st year students.
- Prepared lectures, wrote and graded exams.

### *Pas Facamp (Charity)*

**07/2009 – 09/2009**

- Taught basic finance to the 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 and Michel Destrade

**Funding Value:** €46k

[Hardiman Scholarship](#), PhD fellowship

**09/2011 - 09/2013**

**Title:** Skin deep: the mechanics of skin

**Principal Investigators:** Artur L. Gower and Michel Destrade

**Funding Value:** €42k

[Brazilian National Council for Scientific and Technological Development](#),

M.Sc. fellowship (rank 1/45)

**02/2009 - 03/2011**

**Title:** Nonlinear elastodynamics with radial symmetry

**Principal Investigator:** Artur L. Gower

**Funding Value:** R\$29k ( $\approx$  £5.5k)

[Sao Paulo Research Foundation](#) Undergraduate Research Scholarship

**Title:** Acoustic diffraction with Kirchhoff modelling

**03/2007 - 02/2008**

**Principal Investigator:** Artur L. Gower and Lucio T. Santos

**Funding Value:** R\$6k ( $\approx$  £1.1k)

**Title:** Introduction to discrete chaotic dynamics

**03/2006 - 02/2007**

**Principal Investigator:** Artur L. Gower and Lucio T. Santos

**Funding Value:** R\$6k ( $\approx$  £1.1k)

## RECENT SOFTWARE

[S3] A.L. Gower and J. Deakin. A Julia library for simulating, processing, and plotting multiple scattering of waves. [MultipleScattering.jl](#), GitHub, MIT License.

[S2] A.L. Gower. A Julia library to calculate the effective wave reflection and transmission in material random materials. [EffectiveWaves.jl](#), GitHub, 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](#), GitHub, MIT License.

SUBMITTED	[14] V.J. Pinfield, D.M. Forrester, A.L. Gower, W.J. Parnell, I.D. Abrahams, “Thermo-visco-acoustic scattering by a spherical particle: comparison of analytical and finite element models”, <i>submitted</i>
REFEREED JOURNAL PAPERS	<p>Total citations: 136, according to my <a href="#">Google Scholar</a>.</p> <p>[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”, <i>Europhysics Letters</i>, (2018) 122 (5)</p> <p>[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”, <i>Proceedings of the Royal Society A</i>, (2018)</p> <p>[11] A. Agosti, A.L. Gower, P. Ciarletta, “The constitutive relations of initially stressed incompressible Mooney-Rivlin materials”, <i>Mechanics Research Communications</i>, (2017)</p> <p>[10] A.L. Gower, T. Shearer, P. Ciarletta, “A new restriction for initially stressed elastic solids”, <i>Quarterly Journal of Mechanics and Applied Mathematics</i>, 70(2017)</p> <p>[9] M. Carfagna, M. Destrade, A.L. Gower, A. Grillo, “Oblique wrinkles”, <i>Philosophical Transactions of the Royal Society A</i>, Invited contribution to the themed issue on <i>Patterning through instabilities in complex media</i>, 375(2017)</p> <p>[8] P. Ciarletta, M. Destrade, A.L. Gower, M. Taffetani, “Morphology of residually stressed tubular tissues: beyond the elastic multiplicative decomposition”, <i>Journal of the Mechanics and Physics of Solids</i>, 90 (2016)</p> <p>[7] P. Ciarletta, M. Destrade, A.L. Gower, “On residual stresses and homeostasis: an elastic theory of functional adaptation in living matter”, <i>Scientific Reports</i>, 6 (2016)</p> <p>[6] R.M. Gower, A.L. Gower, “High order reverse automatic differentiation with emphasis on the third order”, <i>Mathematical Programming SERIES A</i>, 155 (2016)</p> <p>[5] A.L. Gower, P. Ciarletta, M. Destrade, “Initial stress symmetry and its application in elasticity”, <i>Proceedings of the Royal Society A</i>, 471 (2015)</p> <p>[4] A.L. Gower, “Connecting the material parameters of soft fibre-reinforced solids with the formation of surface wrinkles”, <i>Journal of Engineering Mathematics</i>, Special Issue on Fibre-Reinforced Materials, 95 (2015)</p> <p>[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”, <i>Journal of the Mechanical Behavior of Biomedical Materials</i>, 39 (2014)</p> <p>[2] A.L. Gower, M. Destrade, R.W. Ogden, “Counter-intuitive results in acousto-elasticity”, <i>Wave Motion</i>, Special Issue in Honour of V.I. Alshits, 50 (2013)</p> <p>[1] P. Ciarletta, M. Destrade, A.L. Gower, “Shear instability in skin tissue”, <i>Quarterly Journal of Mechanics and Applied Mathematics</i>, 66 (2013)</p>
TECHNICAL REPORTS	<p>[6a] A.L. Gower, Chapter: “Generating feasible solutions: part 1”, In: Automatic Optimised Design of Umbilicals (ESGI 100), <i>MIIS Eprints Archive</i>, 710 (2016)</p> <p>[3a] A.L. Gower, Chapter: “Elimination of errors from track line detection”, In: Train Positioning Using Video Odometry (ESGI 116), <i>MIIS Eprints Archive</i>, 672 (2014)</p> <p>[1b] A.L. Gower, C. Brett, J. Herterich, K. Katterbauer, A. Melnik, J. Thompson, “Modelling of abrasive waterjet etching” (OCCAM 4th Modelling Camp), (2012)</p> <p>[1a] A.L. Gower, “Detecting Geometric Faults from Measured Data” (ESGI 85), <i>MIIS Eprints Archive</i>, 659 (2012)</p>

ACADEMIC SERVICES	<b>Reviewer:</b> <i>Proceedings of the Royal Society A</i>   <i>International Journal of Non-Linear Mechanics</i>   <i>IMA Journal of Applied Mathematics</i>   <i>SIAM Journal of Applied Mathematics</i>   <i>ZAMP</i> (Journal of Applied Mathematics and Physics)   <i>Journal of the Acoustical Society of America</i>   <i>Acta Acustica United with Acustica</i>
OUTREACH	<ul style="list-style-type: none"> <li>• <a href="#">The New Scientist Live</a>. A science festival that attracts over 30,000 visitors. I demonstrated acoustic levitation and other phenomena over a weekend. <b>09/2018</b></li> <li>• <a href="#">Science Showdown! <i>How can we measure the invisible: the mathematics of jiggly waves</i></a>. A talk promoting maths to a wider audience in Manchester. <b>03/2017</b></li> <li>• Science Experience Workshop: on open days we gave potential students a hands on science experience. I ran a stand on maths/physics puzzles. <b>2011 - 2014</b></li> <li>• Maths Enrichment: Teach two morning sessions preparing students for the Irish and international mathematics Olympiad. <b>2014</b></li> <li>• School Presentation for the School of Science: Two school visits to engage with students about studying science at university. <b>2011</b></li> </ul>
EVENTS CO-ORGANIZED	<ul style="list-style-type: none"> <li>• <a href="#">Acoustics Early Career Summer School</a> <b>6–9/08/2018</b> A workshop to train early career acousticians in career development, public speaking, writing for the general public and industry collaboration</li> <li>• <a href="#">Constitutive Behaviour of Soft Tissues</a> <b>31/08–2/09 2016</b> A workshop to establish the state-of-the-art in constitutive behaviour of soft tissue</li> <li>• <a href="#">Joint Symposium: Irish Mechanics Society and Irish Society for Scientific Engineering &amp; Computation (ISSEC)</a> <b>8–9/11/2014</b> An annual international mechanics conferences</li> <li>• <a href="#">Irish Applied Maths Research Students' Meeting</a> <b>11/10/2014</b> Organized by the SIAM student chapter, this was the first meeting of postgraduates working in applied mathematics across Ireland.</li> <li>• <a href="#">Stokes Modelling Workshop</a> <b>23–26/06/2014</b> A modelling workshop to solve problems brought by industry, in the same style as the European Study Groups with Industry.</li> </ul>
RECENT TALKS	<p>I have given over 20 academic talks in workshops and international conferences.</p> <ul style="list-style-type: none"> <li>• <a href="#">I. David Abrahams 30th workshop</a>, “Waves in random particulate materials”, Isaac Newton Institute for Mathematical Sciences (INI), Cambridge, UK <b>09/2018</b></li> <li>• <a href="#">Research seminar</a>, “Using machine learning to characterise complex materials”, Malvern Panalytical Ltd, Malvern, UK <b>08/2018</b></li> <li>• <a href="#">Bremen Workshop on Light Scattering 2018</a>, “Characterising particulate random media from near-surface backscattering, Bremem, Germany <b>03/2018</b></li> <li>• Meeting of the Acoustical Society of America, 141 (5), 3810-3810, “<a href="#">Characterizing composites with acoustic backscattering: Combining data driven and analytical methods</a>”, Boston, USA <b>06/2017</b></li> <li>• New mathematics for a safer world: wave propagation in heterogeneous materials, “<a href="#">Characterising random composites with acoustic backscattering</a>”, International Centre for Mathematical Sciences (ICMS), Edinburgh, UK <b>06/2017</b></li> <li>• <a href="#">Constitutive behaviour of soft tissues</a>, “Constitutive modelling of initially stressed elastic solids”, Manchester, UK <b>09/2016</b></li> </ul>