

Academic Curriculum Vitae

Jonathan Stanger

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Qualifications

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| 2013 | PhD, University of Canterbury, Mechanical Engineering |
| 2008 | MSc, University of Canterbury, Physics |
| 2005 | BSc, University of Canterbury, Physics and Chemistry |

Professional Positions Held

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| 2014-now | LEAP in Engineering Ambassador (Volunteer Position) |
| 2013-14 | Post-doctoral Researcher, Plant and Food Research Ltd., Bioresources Engineering and Chemistry |
| 2010-14 | Futureintech Ambassador (Volunteer Position) |
| 2009-13 | Research Assistant, Plant and Food Research Ltd., Bioresources Engineering and Chemistry |
| 2008-now | Scientific Adviser, Electros핀z Ltd. |
| 2007-07 | Visiting Research Fellow, Warwick University, Warwick Manufacturing Group |
| 2005-09 | Research Assistant, Crop and Food Research Ltd. (CFR), Food and Biomaterials Innovation |

Peer Reviewed Publications

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| 2009 | <i>Effect of salts on the electrospinning of poly(vinyl alcohol)</i> , J J Stanger , N Tucker, N Larsen, M Staiger, K Kirwan, S Coles, D Jacobs, American Institute of Physics Conference Proceedings |
| 2009 | <i>Effect of charge density on the Taylor cone in Electrospinning</i> , J J. Stanger , N. Tucker, K. Kirwan, S. Coles, D. Jacobs, M. Staiger, International Journal of Modern Physics B, , 23(06n07) |
| 2009 | <i>The Effect of Electrode Configuration and Substrate Material on the Mass Deposition Rate of Electrospinning</i> , J J Stanger , N Tucker, N Larsen, M Staiger, R Reeves, Journal of Applied Polymer Science, 112, 1729-1737 |
| 2009 | <i>Electrospinning</i> , J Stanger, N Tucker, M Staiger, Rapra Review Reports, vol. 16, 2009 |
| 2010 | <i>A Design of Experiments (DoE) Approach to Materials Properties Optimization of Electrospun Nanofibers</i> , S R Coles, D K Jacobs, J O Meredith, G Barker, A J Clark, K Kirwan, J J Stanger , N Tucker, Journal of Applied Polymer Science, 117, 2251-2257 |
| 2012 | <i>Manipulation of Electrospun Fibers in Flight: The Principle of Superposition of Electric Fields as a Control Method</i> , A H Nurfaizey, J J Stanger , N Tucker, N Buunk, A Wallace, M P Staiger, Journal of Materials Science, 47, 1156-1163 |

- 2012 *Effects of the molecular format of collagen on characteristics of electrospun fibers*, K Hofman, N Tucker, **J J Stanger**, M Staiger, S Marshall, B Hall, Journal of Materials Science, 47, 1148-1155
- 2012 *Insights into the power law relationships that describe mass deposition rates during electrospinning*, **J J Stanger**, N Tucker, S Fullick, M Sellier, M Staiger, Journal of Materials Science, 47, 1113-1118
- 2012 *The History of the Science and Technology of Electrospinning from 1600 to 1995*, N Tucker, **J J Stanger**, M Staiger, H Razzaq, K Hofman, Journal of Engineered Fibers and Fabrics, 7
- 2012 *Functional nanofibers in clothing for protection against chemical and biological hazards*, A H Nurfaizey, N Tucker, **J J Stanger**, M Staiger, Functional nanofibers and their applications, Book Chapter 12

Other Publications

- 2007 *Fundamental Mechanisms applied to Electrospinning Process Control*, **J J Stanger**, N Tucker, N Larsen, M Staiger, R Reeves, 29th Australasian Polymer Symposium, Hobart, Australia.
- 2007 *Aspects of Electrospinning Process Control from Fundamental Mechanisms*, **J J Stanger**, N Tucker, N Larsen, M Staiger, R Reeves, 2007 ANTEC Conference, Cincinnati, USA.
- 2007 *Effect of Electrode Configuration and Substrate Material on the Mass Deposition Rate of Electrospun Fibre*, **J J Stanger**, N Tucker, N Larsen, M Staiger, R Reeves, VOPNET, Coventry, United Kingdom, September 2007
- 2008 *An experimental study of the effect of charge density on the Taylor cone*, **J J Stanger**, N. Tucker, N. Larsen, M. Staiger, R. Reeves, K. Kirwan, European Materials Research Society, Fall Meeting Warsaw 14th September 2008
- 2008 *Effect of charge carrier modes on the bending instability in the electrospinning process*, **J J Stanger**, N Tucker, N Larsen, M Staiger, K Kirwan, S Coles, D Jacobs, 30th Australasian Polymer Symposium, Melbourne, Australia 30th November 2008
- 2008 *Green Industrialization for Developing Nations*, **J J Stanger**, N Tucker, S Coles, NZSSES Blueprints for Sustainable Infrastructure, Auckland, New Zealand 9th December 2008
- 2009 *Effect of salts on the electrospinning of poly(vinyl alcohol)*, **J J Stanger**, N Tucker, N Larsen, M Staiger, K Kirwan, S Coles, D Jacobs, 4th Advanced Materials and Nanotechnology, Dunedin, New Zealand, 8th February 2009
- 2010 *Numerical Modelling of Electrospinning Dynamics*, **J J Stanger**, N Tucker, M Staiger, M Sellier, A Wood, N Larsen, 11th Pacific Polymer Conference, Cairns, Australia, January 2010
- 2010 *Characterization of the Electrospinning Process*, **J J Stanger**, N Tucker, M Staiger, M Sellier, A Wood, J Phillips, R Lamberts, N Larsen, S Fullick, ElectroSpin2010, Melbourne, Australia, 26-29 January 2010

2012 *Charge Loss in the Electrospinning System*, J J Stanger, N Tucker, M Sellier, A Wood, M Staiger, 33rd Australasian Polymer Symposium, Hobart, Australia, February 2012

References

[Commercial]

Dr. Nick Tucker - Team Leader, Plant and Food Research

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[Academic]

Dr. Mathieu Sellier - Senior Lecturer, University of Canterbury

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[Industrial]

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PhD Skills Summary

My PhD thesis was titled "Experimental Assessment of Charge Flow in Electrospinning". During this process I developed the hardware and software required to semi-automate data collection while performing a number of electrospinning experiments. I was able to construct the required hardware using off the shelf modules and circuits. Using my software skills in MATLAB™, R and Python I was able to create scripts for processing over 300,000 observations into a manageable representative data set. To facilitate understanding of the experimental results I needed to understand the material and chemical properties of polymer solutions. This included surface tension, rheology, conductivity and DSC. The early stages of my PhD work were involved heavily with mathematical simulation. I wrote differential equation solving algorithms from scratch and worked with finite element and boundary element methods. I was able to work competently with electrohydrodynamic fluid models although ultimately this work did not lead to publishable results. I was also able to apply my skills to automated image analysis by building an algorithm that can detect electrospun fibre and measure features thereof. Finally, I was able to integrate high speed video equipment with the previous skills to measure the electrospun jet flight time that was previously unable to be measured. This experience has left me with a flexible and practical skill set, able to take on many different roles in experimental science and smoothly interface with most specialists in the physical sciences and engineering fields.

Skills, Training and Expertise

Proficient:

Basic Electronics, COMSOL™, Digital Image Processing, Electron Microscopy, High Speed Video Capture, High Voltage Measurements, LabVIEW™, MATLAB™, Microsoft Office, National Instruments Data Capture, Machine Concept Design, Practical Laboratory Techniques, Process Characterization

Competent:

Composite Layup and Vacuum Curing, DSC, DMTA, FT-IR, General CFD Techniques, Intermediate Electrical and Electronic Engineering, Industrial Polymer Processing, Natural Cosmetics Formulation, Numerical Algorithms to Solve ODE's, Optical Microscopy, Python, R statistical language, Rheometry, Statistical Analysis of Data, TGA, Universal Mechanical Testing, Vacuum Technologies

Professional Interests and Hobbies

Astrospace Engineering, Automated Scientific Experiments, Continuous Bio Monitoring, Electric Neural Stimulation, Mental Health and Wellbeing, Quantified Self, Science Communication, Scientific Computing, Sustainable Infrastructure, Sustainable Food and Energy Production, Sustainable Materials, Transhumanism, Wearable Computing