

Martin Robinson

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Date of Birth: 22/07/78

P R O F E S S I O N A L P R E P A R A T I O N

- Postdoctoral Research Assistant**, Mathematical Institute, University of Oxford, UK Oct 2012 - current
Oxford Centre for Collaborative Applied Mathematics (OCCAM) &
Wolfson Centre for Mathematical Biology (WCMB)
- Marie Curie Experienced Researcher**, University of Twente, Netherlands July 2010 – July 2012
Multiscale Mechanics group
- Research Projects Officer**, CSIRO, Australia Feb 2009 – March 2010
Commonwealth Scientific and Research Organisation (CSIRO)
Mathematical and Information Science Division (CMIS), Computational Modeling (CM) Group
- Doctor of Philosophy in Mathematical Sciences**, Monash University, Australia July 2005- Aug 2009
Title: Viscous and Turbulent Mixing using Smoothed Particle Hydrodynamics
- Research Scientist**, Defense, Science and Technology Organisation (DSTO), Australia Nov 2002 – July 2005
Intelligence, Surveillance and Reconnaissance Division
Tracking and Sensor Fusion Group
- Master of Philosophy in Computer Engineering**, University of Queensland, Australia Jan 2001- March 2002
Title: A Logical Formulation of the 3D Reconstruction Problem using a Volumetric Framework
- Bachelor of Computer Systems Engineering**, University of Queensland, Australia 1996 to 2000
GPA: 6.65, University Medalist (top 1%)
- Bachelor of Computer Science**, University of Queensland, Australia 1996 to 2000
GPA: 6.65, University Medalist (top 1%)

T E A C H I N G

- Co-supervisor**, University of Twente Feb 2014 - current
Giuseppe Raso (Masters project: *SPH-DEM modelling of bidisperse particulate flows*)
- Tutor and Consultation Classes**, University of Oxford April 2013 – Jan 2014
B8a Mathematical Ecology and Biology
- Supervisor**, University of Oxford June 2012 – August 2012
Robert Ross, Marcin Paczkowski and Andreas Harris (DTC Short Project students)
- Demonstrator**, University of Oxford Jan 2013
Mathematical Biology, Systems Biology DTC

Co-supervisor , University of Twente Dinant Krijgsman and Elena Gagarina (PhD students)	Jan 2012 – July 2012
Lecturer , University of Twente Advanced Programming in Engineering (APiE)	Feb, 2011 & 2012
Tutor , Monash University Advanced Engineering Mathematics (2 nd Year level) Engineering Mathematics (1 st Year level)	Jan 2006 – Oct 2008
Tutor , University of Queensland Fundamentals of Computer Engineering (2 nd Year level) Computer Architecture I (3 rd Year level) Introduction to Information Systems (1 st Year level) Signal and Image Processing I (3 rd Year level) Computer Networks II (4 th Year level)	Feb 1999 – July 2001

R E S E A R C H I N T E R E S T S

- **Multiscale & Multiphase Modelling**
- **Meshless Methods** - Smoothed Particle Hydrodynamics (SPH)
- **Individual-based (Discrete) Models** – Discrete Element Method (DEM), Stochastic Lattice (Gillespie) and Off-Lattice (Brownian Dynamics)
- **Complex Fluids** - Granular Matter, Liquid Crystals, Biological Materials
- **High performance and parallel computing**

R E F E R E E S

Dr Radek Erban, Mathematical Institute, University of Oxford
Relationship: My supervisor at University of Oxford (Oct 2012 – current)
Phone: +44 1865 615134 **E-Mail:** erban@maths.ox.ac.uk

Dr. Marco Ramaioli, Research Scientist at Nestlé Research Center / Food Science and Technology
Relationship: Industrial supervisor for University of Twente Postdoc position (July 2010 – July 2012)
Phone: +41 (0)21 785 87 66 **E-Mail:** Marco.Ramaioli@rdls.nestle.com

Prof. Joseph Monaghan, Professor – School of Mathematical Sciences, Monash University
Relationship: My PhD supervisor at Monash University (July 2005 – Aug 2009)
Phone: +61 3 9905 4463 **E-Mail:** joe.monaghan@monash.edu

Dr. Paul Cleary, Head of Computational Modeling, CSIRO Mathematical and Information Sciences, Australia
Relationship: PhD co-supervisor (July 2005 – Aug 2009) and supervisor at CSIRO (Feb 2009 – March 2010)
Phone: +61 3 9545 8005 **E-Mail:** paul.cleary@csiro.au

PROFESSIONAL ACTIVITIES

Refereed papers for the following journals:

American Institute of Chemical Engineering (AIChE)
International Journal of Numerical Methods in Fluids
Granular Matter
Computers and Fluids
Acta Mechanica
Particulate Science and Technology
Chemical Theory and Computation

Organising Committee for PARDEM workshop, Nestlé Research Center, Switzerland 22nd – 28th Jan 2012
Workshop for PARDEM network (www.pardem.eu) and invited collaborators

Scientific Presentations:

Jan 2014. *Invited seminar*, Uppsala University, Sweden “Multiscale reaction-diffusion modelling: Application to stochastic front propagation”

Oct 2013. *Internal seminar*, University of Oxford “Hybrid Modelling for Stochastic Travelling Waves”

May 2013. *Internal seminar*, University of Oxford “Software development for reaction-diffusion modelling”

August 2012. *Invited seminar*, Nestlé Research Centre, Switzerland “Sedimentation and dispersion of grains in liquid using SPH-DEM”

June 2012. *Invited seminar*, University of Edinburgh, UK “Fluid-particle simulation using Smoothed Particle Hydrodynamics and Discrete Element Method (SPH-DEM)”

Jan 2012. *PARDEM workshop*, Nestlé Research Centre, Switzerland, “Sedimentation and granular bed dispersion using SPH-DEM”

Jan 2012. *Physics@FOM Conference*, Veldhoven, Netherlands, “Meshfree simulation of mesoscale fluid-particle systems”

Nov 2011. *Invited lecture*, Nestlé Research Centre, Switzerland “An Introduction to Smoothed Particle Hydrodynamics”

Oct 2011. *Internal seminar*, University of Twente, “Verification of an SPH-DEM numerical model using 3D sedimentation”

Sept 2011. *PARDEM workshop*, University of Edinburgh, “Numerical Modeling of Fluid-Particle Systems using Smoothed Particle Hydrodynamics (SPH) and DEM”

July 2011. *The 3rd Particulate Processes in the Pharmaceutical Industry Conference*, “Numerical Modeling of Fluid-Particle Systems using Smoothed Particle Hydrodynamics (SPH) and DEM”

June 2011. *6th International SPHERIC SPH Workshop*, Hamburg, “Mesoscale fluid-particle interaction using two-way coupled SPH and the Discrete Element Method (DEM)”

Feb 2011. *Internal seminar*, University of Twente, “A Lagrangian method for mesoscale particle-fluid interaction: Smoothed Particle Hydrodynamics and the Discrete Particle Method”

June 2008. *3rd International SPHERIC SPH Workshop* “Forced two-dimensional wall-bounded turbulence using SPH”

June 2007. *2nd International SPHERIC SPH Workshop*. “DNS SPH simulation of 2D wall- bounded turbulence”

Dec 2006. *Fifth Int. Conference on CFD in the Process Industries*, Melbourne. “Analysis of mixing in a Twin-Cam mixer using Smoothed Particle Hydrodynamics”

Poster Presentations:

July 2013. *The Oxford Conference on Challenges in Applied Mathematics (OCCAM)* “Software development for multiscale reaction-diffusion modelling”

July 2013. *Powders and Grains 2013*, Sydney, Australia. “Grain Sedimentation with SPH-DEM and its Validation”

July 2013. *Powders and Grains 2013*, Sydney, Australia. “SPH-DEM simulations of grain dispersion by liquid injection”

April 2011. *JMBC Conference*, Eindhoven, Netherlands. “Smoothed Particle Hydrodynamics (SPH): Turbulence and Particle-Fluid Coupling”

P U B L I C A T I O N S

Refereed Journal Papers:

1. Jens Harting, Stefan Frijters, Marco Ramaioli, Martin Robinson, Dietrich E. Wolf, Stefan Luding (2014), Recent advances in the simulation of particle-laden flows, accepted by The European Physical Journal Special Topics.
2. Martin Robinson, Mark Flegg and Radek Erban (2014), “Adaptive two-regime method: Application to front propagation,” *Journal of Chemical Physics*, 140, 124109.
3. Martin Robinson, Stefan Luding and Marco Ramaioli, (2014). Fluid-particle flow modelling and validation using two-way-coupled mesoscale SPH-DEM, *Int. Journal of Multiphase Flow*, 59:121-134.
4. Martin Robinson and Paul Cleary, (2012). Flow and Mixing Performance in Helical Ribbon Mixers. *Chemical Engineering Science*, 84: 382-398
5. Martin Robinson and Joseph Monaghan. (2012), Direct numerical simulation of decaying two-dimensional turbulence in a no-slip square box using smoothed particle hydrodynamics. *Int. J. Numer. Meth. Fluids*, 70: 37–55. doi: 10.1002/flid.2677
6. Martin Robinson and Paul Cleary, (2011). The influence of cam geometry and operating conditions on chaotic mixing of viscous fluids in a twin cam mixer. *AIChE Journal*, 57:581- 598.
7. Martin Robinson, Paul Cleary, Joe Monaghan, (2008). Analysis of mixing in a Twin-Cam mixer using Smoothed Particle Hydrodynamics, *AIChE Journal*, 54(8):1987-1998.
8. Martin Robinson, Kurt Kubik, Brian Lovell, (2005). A first order predicate logic formulation of the 3D reconstruction problem and its solution space, *International Journal of Pattern Recognition and Artificial Intelligence (IJPRAI)*, 19(1):45-62.

Conference Proceedings (refereed on full paper):

1. Martin Robinson, Marco Ramaioli, Stefan Luding (2013) Grain Sedimentation with SPH-DEM and its Validation, Powders and Grains 2013, Sydney
2. Martin Robinson, Stefan Luding, Marco Ramaioli (2013) SPH-DEM simulations of grain dispersion by liquid injection, Powders and Grains 2013, Sydney
3. Paul Cleary, Martin Robinson, (2011) Understanding viscous fluid transport and mixing in a twin screw extruder, 8th International Conference on CFD in the Oil & Gas, Metallurgical and Process Industries
4. Martin Robinson, Paul Cleary, Joe Monaghan, (2006). Analysis of mixing in a Twin-Cam mixer using Smoothed Particle Hydrodynamics”, Fifth Int. Conference on CFD in the Process Industries, Melbourne.

Conference Proceedings (refereed on abstract only):

1. Mohammadreza Ebrahimi, Prashant Gupta, Martin Robinson, Martin Crapper, Marco Ramaioli, Jin Y. Ooi (2013) DEM-CFD and SPH-DEM methods in single and multiple particle sedimentation test cases, III International Conference on Particle-based Methods – Fundamentals and Applications PARTICLES 2013
2. Martin Robinson, Marco Ramaoli, (2011). Mesoscale fluid-particle interaction using two-way coupled SPH and the Discrete Element Method, SPH European Research Interest Community (SPHERIC) workshop
3. Martin Robinson, Joe Monaghan, (2008). Forced two-dimensional wall-bounded turbulence using SPH, SPH European Research Interest Community (SPHERIC) workshop, Lausanne.
4. Martin Robinson, Joe Monaghan, John Mansour, (2007). DNS SPH simulation of 2D wall- bounded turbulence”, SPH European Research Interest Community (SPHERIC) workshop, Madrid.
5. S. Maskell, N. Gordon, N. Everett, M. Robinson, (2004). Tracking maneuvering targets using a scale mixture of normals, Proc. of SPIE Signal and Data Processing of Small Targets, Orlando.
6. Neil Gordon, Branko Ristic, Martin Robinson, (2003). Performance Bounds for Recursive Sensor Registration, Proc. of Sixth International Conference on Information Fusion, Cairns, Australia.
7. Neil Gordon, John Percival, Martin Robinson, (2003). The Kalman-Levy filter and heavy-tailed models for tracking maneuvering targets, Proc. of Sixth International Conference on Information Fusion, Cairns, Australia.
8. Rebecca McFadden, John Homer, R. J. Sault, Martin Robinson, (2003). Non-Gaussian Interference Characterisation with Application to Current Radio Astronomy Techniques, Proc. of Seventh International Symposium on Signal Processing and its Applications (ISSPA), Paris.
9. M. Robinson, K. Kubik, D. McKinnon and R. Andrews. (2001). The Viterbi Algorithm as an Alternative to Energy Minimization for Stereo Image Matching, SPIE Three-Dimensional Image Capture and Applications IV, California.