




Gordon McDonald

data science | statistics | physics | mathematics | teaching

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math

statistics+probability
bayesian models
advanced calculus
optimization
non-linear fitting
principal component
analysis

physics

electromagnetism
quantum mechanics
waves and optics
laboratory work

coding+data analysis

R
Matlab
Python
Tableau
Excel

interests

automation
engineering
web design
economics
psychology
graphic design
electronics
latin dance
fitness
climbing
photography
cooking
running
entry



I am a scientist, data nerd and teacher, currently working at the Centre for Translational Data Science, at the University of Sydney. I have extensive simulation and computational data analysis experience developed during 7 years of cutting-edge physics research, and a passion for informative data visualization techniques. I have taught university level physics courses in Australia and Indonesia, as well as tutoring students in Statistics, Mathematics, Physics and Chemistry. My public speaking abilities have been demonstrated while presenting my doctoral research at other universities in Australia, Indonesia, the US, and Europe, and I have co-authored 16 peer-reviewed papers in academic journals, as well as writing my honours and doctoral theses. I am experienced in working in a small team environment using agile management techniques. I have supervised two honours students and assisted in training three other PhD students.

experience

2016–Now	Sydney Informatics Hub <i>Data Science Research Engineer</i>	The University of Sydney
2015	Quantum Sensors and Atom Laser Group <i>Postdoctoral Researcher</i>	Australian National University
2010–2015	PhD in Experimental Quantum Physics Thesis: <i>“Cold Atom Interferometry in Optical Potentials”</i> Worked in a small team to develop and prototype the next generation of quantum sensors for fundamental science and industrial applications.	Australian National University
2009	First class Honours with University Medal in Physics, Thesis: <i>“Detecting Atomic Shot Noise On Ultra-cold Atom Clouds”</i>	Australian National University
2006–2008	Bachelor of Science Majoring in Physics and Chemistry, minor in Mathematics. High Distinction average of 90% (Grade point average of 6.87 out of 7).	Australian National University
2004–2005	College (Years 11 and 12) University Admissions Index of 99.5%.	Narrabundah College, Canberra

teaching experience

2013–2014	Foundation of Physics (first year physics course) <i>Lab Demonstrator</i>	Australian National University
2013	International Engineering Program <i>Guest Lecturer</i>	University of Indonesia
2012–2015	ANU Dance and Salsabor Dance Studio <i>Dance Teacher</i>	Canberra, Australia and Washington DC, USA
2010–2011	Advanced Physics Tutor I tutored Honours Electromagnetism and Advanced Theoretical Physics	Australian National University
2006–2011	Private Tutor Year 10-12 and university Mathematics, Statistics, Physics and Chemistry.	Canberra

awards

2014	Vice Chancellor's Award for Outstanding Contribution to Student Learning	ANU
2010–2015	Australian Postgraduate Award+Research Supplementary Scholarship	ANU
2009	University Medal	ANU
2006-2009	PhB scholarship	ANU
2006, 2008	Summer Scholarship	ANU
2006	ANUTECH Chemistry Scholarship	ANU

publications

My doctoral research resulted in 15 scientific publications in peer-reviewed journals and 12 presentations delivered around the world, in addition to my doctoral thesis, all of which are available upon request. My honours thesis is also available. Three selected first-author publications are highlighted below.

2014	A Bright Solitonic Matter-Wave Interferometer	Physical Review Letters
	A soliton is a non-dispersive cloud of atoms. We present the first soliton-based matter-wave interferometer, and show that using a soliton increases the visibility of the interference fringe. Phys. Rev. Lett. 113 013002 (2014)	
2014	A faster scaling in acceleration-sensitive atom interferometers	Europhysics Letters
	The signal in an atom-optic accelerometer scales at best with the square of the time it is measured for, until now. We demonstrate a signal which scales with the cube (and higher powers) of the time it is measured for. This paper was highlighted as an Editor's Choice. Europhysics Letters 105 63001 (2014)	
2013	Optically guided linear Mach-Zehnder atom interferometer	Physical Review A
	Cold atoms held along a horizontal tube, an optical waveguide, were used to make an acceleration sensor by interfering them with one another. Phys. Rev. A 87 , 013632 (2013)	