CURRICULUM VITAE

Dr Marcus William Doherty

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Academic Awards, Fellowships and Scholarships

2015 *Geoff Opat Early Career Researcher Prize*, the Australian Optical Society.

Dr Phillip Law AC Postdoctoral Award, The Royal Society of Victoria.

Runner-up to the New Journal of Physics Early Career Award, the New Journal of Physics.

2014 *Early Career Research Travel Grant,* the Australian National University.

2013 *Chancellor's Prize for Excellence in the PhD thesis*, the University of Melbourne.

Nomination for the *Bragg Gold Medal for Excellence in Physics*, the Australian Institute of Physics.

2012 *Visiting Fellowship of the Network for Functional Nanotechnologies*, Baden-Württemberg Stiftung, Germany.

Staff Development Scholarship, the Australian National University.

2011 *David Hay Postgraduate Writing Up Award*, the University of Melbourne.

2010 *CISRA Student Presentation Prize*, the 19th Australian Institute of Physics Congress.

2009 *Overseas Research Experience Scholarship*, the University of Melbourne.

2008 *Australian Postgraduate Award.*

2007 *John Tyndall Scholarship*, the University of Melbourne.

Quantum Communications Victoria Honours Scholarship, the University of Melbourne.

Competitive Funding

2015-2017 *DAAD-Go8 Cooperation Scheme*

Spin-mechanical quantum technologies in diamond
Investigators: N.B. Manson, F. Jelezko, and M.W. Doherty.

2014-2016 *ARC Discovery Project Scheme*

DP140103862 - Mechanical control of defect spins in diamond and its applications in quantum technology.
Investigators: N.B. Manson, M.W. Doherty and K. Ganesan.

Academic Employment

2014+ *Postdoctoral Fellow* - Laser Physics Centre, Research School of Physics & Engineering, Australian National University, Australia.

2012-2014 *Postdoctoral Fellow* - Laser Physics Centre, Research School of Physics & Engineering, Australian National University, Australia.

Tertiary Education

2012-2013 Graduate Certificate in Higher Education, Australian National University, Australia.

2008-2012 Doctor of Philosophy – Science, University of Melbourne, Australia.

PhD thesis: *The Theory of the Nitrogen-Vacancy Colour Centre in Diamond.* Supervisor: Prof. Lloyd Hollenberg, Theoretical Condensed Matter Physics Group, School of Physics.

2001– Bachelor of Engineering (Mechanical) Honours/ Science Honours, University of Melbourne, Australia.

2007 Science Honours (Physics) Research Project: *Nano-diamond Quantum Key Distribution Devices.* Supervisors: Prof. Lloyd Hollenberg and Dr. Brant Gibson, Quantum Communications Victoria, School of Physics.

Professional Affiliations

- Member of the Australian Institute of Physics.
- Member of the Australian Optical Society.
- Member of the Optical Society of America.

Summary of Research Contributions

The following data is drawn from the Scopus database:

Total citations	620	h-index	11
Number of refereed journal articles	22	Number of refereed conference papers	4
Number of other (un-refereed) publications	1	Number of invited conference presentations	4
Number of contributed conference presentations	10		

Refereed Journal Publications

The journal impact factor and the number of citations, as per the Scopus database on 15 January 2016, are as indicated for each publication.

No.	Year	Publication	Impact Factor	Citations (Scopus)
1	2015	M.L. Goldman, A. Sipahigil, **M.W. Doherty**, N.Y. Yao, S.D. Bennett, M. Markham, D.J. Twitchen, N.B. Manson, A. Kubanek and M.D. Lukin, *Phonon-induced population dynamics and intersystem crossing in nitrogen-vacancy centers*, **Physical Review Letters**, 114, 145502 (2015).	7.728	4
2	2015	T. Plakhotnik, **M.W. Doherty** and N.B. Manson, *Electron-phonon processes of the nitrogen-vacancy center in diamond*, **Physical Review B**, 92, 081203(R) (2015).	3.664	0
3	2015	M.L. Goldman, **M.W. Doherty**, A. Sipahigil, N.Y. Yao, S.D. Bennett, N.B. Manson, A. Kubanek and M.D. Lukin, *State-selective intersystem crossing in nitrogen-vacancy centers*, **Physical Review B**, 91, 165201 (2015).	3.664	3
4	2015	K. Jahnke, A. Sipahigil, J. Binder, **M.W. Doherty**, M. Metsch, L.J. Rogers, N.B. Manson, M. Lukin and F. Jelezko, *Electron-phonon processes of the silicon-vacancy centre in diamond*, **New Journal of Physics**, 17, 043011 (2015).	3.673	2

5	2015	L.J. Rogers, **M.W. Doherty**, M.S.J. Barson, S. Onoda, T. Ohshima and N.B. Manson, *Singlet levels of the NV- centre in diamond*, **New Journal of Physics**, 17, 013048 (2015).	3.673	1
6	2014	T. Plakhotnik, **M.W. Doherty**, J.H. Cole, R. Chapman and N.B. Manson, *All-optical thermometry and thermal properties of the optically detected spin resonances of the NV- center in nanodiamond*, **Nano Letters**, 14, 4989 (2014).	12.904	7
7	2014	**M.W. Doherty**, V.M. Acosta, A. Jarmola, M.S.J. Barson, N.B. Manson, D. Budker and L.C.L. Hollenberg, *Temperature shifts of the resonances of the NV- center in diamond*, **Physical Review B**, 90, 041201(R) (2014).	3.664	6
8	2014	C.A. Meriles and **M.W. Doherty**, *Generation of spin-polarized currents via cross-relaxation with dynamically pumped paramagnetic impurities*, **Applied Physics Letters**, 105, 022403 (2014).	3.515	0
9	2014	F. Dolde, **M.W. Doherty**, J. Michl, I. Jakobi, B. Naydenov, S. Pezzagna, J. Meijer, P. Neumann, F. Jelezko, N.B. Manson and J. Wrachtrup, *Nanoscale detection of a single fundamental charge in ambient conditions using the NV− center in diamond*, **Physical Review Letters**, 112, 097603 (2014).	7.728	16
10	2014	**M.W. Doherty**, J. Michl, F. Dolde, I. Jakobi, P. Neumann, N.B. Manson and J. Wrachtrup, *Measuring the defect structure orientation of a single NV-centre in diamond*, **New Journal of Physics**, 16, 063067 (2014).	3.673	4
11	2014	**M.W. Doherty**, V.V. Struzhkin, D.A. Simpson, L.P. McGuinness, Y. Meng, A. Stacey, T.J. Karle, R.J. Hemley, N.B. Manson, L.C.L. Hollenberg and S. Prawer, *Electronic properties and metrology applications of the diamond NV− center under pressure*, **Physical Review Letters**, 112, 047601 (2014).	7.728	24
12	2014	J. Michl, T. Teraji, S. Zaiser, I. Jakobi, G. Waldherr, F. Dolde, P. Neumann, **M.W. Doherty**, N.B. Manson, J. Isoya and J. Wrachtrup, *Perfect alignment and preferential orientation of nitrogen-vacancy centers during chemical vapor deposition diamond growth on (111) surfaces*, **Applied Physics Letters**, 104, 102407 (2014).	3.515	22
13	2014	L.J. Rogers, K.D. Jahnke, **M.W. Doherty**, A. Dietrich, L.P. McGuinness, C. Müller, T. Teraji, H. Sumiya, J. Isoya, N.B. Manson and F. Jelezko, *Electronic structure of the negatively-charged silicon-vacancy center in diamond*, **Physical Review B**, 89, 235101 (2014).	3.664	14
14	2013	P. Kehayias, **M.W. Doherty**, D. English, R. Fischer, A. Jarmola, K. Jensen, N. Leefer, P. Hemmer, N.B. Manson and D. Budker, *Infrared absorption band and vibronic structure of the nitrogen-vacancy center in diamond*, **Physical Review B**, 88, 165202 (2013).	3.664	7
15	2013	**M.W. Doherty**, N.B. Manson, P. Delaney, F. Jelezko, J. Wrachtrup and L.C.L. Hollenberg, *The nitrogen-vacancy colour centre in diamond*, **Physics Reports**, 528, 1 (2013).	20.394	131
16	2013	S.-Y. Lee, M. Widmann, T. Rendler, **M.W. Doherty**, T. Babinec, S. Yang, M. Eyer, P. Siyushev, B. Haussmann, M. Loncar, Z. Bodrog, A. Gali, N.B. Manson, H. Fedder and J. Wrachtrup, *Readout and control of a single nuclear spin with a meta-stable electron spin ancilla*, **Nature Nanotechnology**, 8, 487 (2013).	33.265	14
17	2013	N.B. Manson, K. Beha, A. Batalov, L.J. Rogers, **M.W. Doherty**, R. Bratschitsch, and A. Leitenstorfer, *Assignment of the NV0 575 nm zero-phonon line in diamond to a 2E - 2A2 transition*, **Physical Review B**, 87, 155209 (2013).	3.664	3
18	2012	D. Maclaurin, **M.W. Doherty**, L.C.L. Hollenberg and A.M. Martin, *Measurable quantum geometric phase from a rotating single spin*, **Physical Review Letters**, 108, 240403 (2012).	7.728	16

19	2012	**M.W. Doherty**, F. Dolde, H. Fedder, F. Jelezko, J. Wrachtrup, N.B. Manson and L.C.L. Hollenberg, *Theory of the ground-state spin of the NV- center in diamond*, **Physical Review B**, 85, 205203 (2012).	3.664	37
20	2011	F. Dolde, H. Fedder, **M.W. Doherty**, T. Nobauer, F. Rempp, G. Balasubramanian, T. Wolf, F. Reinhard, L.C.L. Hollenberg, F. Jelezko and J. Wrachtrup, *Electric-field sensing using single diamond spins*, **Nature Physics**, 7, 459 (2011).	20.603	221
21	2011	**M.W. Doherty**, N.B. Manson, P. Delaney and L.C.L. Hollenberg, *The negatively charged nitrogen-vacancy centre in diamond: the electronic solution*, **New Journal of Physics**, 13, 025019 (2011).	3.673	40
22	2008	F.M. Hossain, **M.W. Doherty**, H.F. Wilson and L.C.L. Hollenberg, *Ab initio electronic and optical properties of the N-V center in diamond*, **Physical Review Letters**, 101, 226403 (2008).	7.728	41

Refereed Conference Proceedings

No.	Year	Publication
1	2015	K. Ganesan, A. Piracha, O. Freidin, **M.W. Doherty**, N. Manson, and S. Prawer, *Single crystal diamond cantilevers for mechanical control of quantum systems*, Nonlinear Optics, NF1A.5 (2015).
2	2012	T.M. Babinec, H. Fedder, J.T. Choy, I. Bulu, **M.W. Doherty**, P.R. Hemmer, J. Wrachtrup and M. Loncar, *Design of diamond photonic devices for spintronics*, *Conference on Lasers and Electro-Optics (CLEO 2012)*, 6326462 (2012)
3	2010	N. B. Manson, L. J. Rogers, R.L. McMurtrie, **M.W. Doherty**, A. Batalov and V. Jacques, *Intrinsic properties of the NV center in diamond*, Advances in Photonics of Quantum Computing, Memory and Communication III, SPIE, 7611, 761105 (2010)
4	2010	**M.W. Doherty**, F.M. Hossain and L.C.L. Hollenberg, *The foundations of the defect-molecule model of the N-V center in diamond,* Procedia, 3, 1525 (2010)

Other (un-refereed) Publications

No.	Year	Publication
1	2015	A.D. Greentree, I. Aharonovich, S. Castelletto, **M.W. Doherty**, L.P. McGuinness and D.A. Simpson, *Nanodiamonds*, Optics and Photonics News, 21, 20 (2010).

Invited Conference Presentations (support provided by conference):

No.	Year	Conference Presentation
1	2015	*Diamond quantum microscopy*, Australian and New Zealand Conference on Optics and Photonics, Adelaide, Australia
2	2015	*Mechanical and electric field sensing using spins in diamond*, Diamond Quantum Sensing Workshop, Takamatsu, Japan
3	2015	*Advances in the study of the NV center*, Materials Research Society Spring Meeting, San Francisco, USA
4	2014	*The quantum age of diamond*, Gordon Research Seminar: Defects in Semiconductors, Bentley University, Massachusetts, USA