

Dr. Nicholas F. Chilton MRSC

Ramsay Memorial Research Fellow

School of Chemistry, The University of Manchester

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Summary

General expertise concerning Quantum Mechanics, electronic structure, computational chemistry, molecular magnetism, theoretical magnetism and EPR and optical spectroscopies. Author of *PHI* and *MAGELLAN* codes for magnetic analysis and determination of magnetic anisotropy. H-index of 27 and 76 publications with over 2700 citations in journals such as *Nature*, *J. Am. Chem. Soc.*, *Nature Commun.*, *Angew. Chem.*, and *Chem. Sci.* International recognition with numerous invited lectures.

Skills

SQUID magnetometry (DC and AC for regular and air-sensitive solids and solutions)

EPR spectroscopy (CW X-, K-, Q- and W-band for regular and air-sensitive solids and solutions)

CASSCF *ab initio* calculations (including two-component relativistic approaches)

DFT calculations (both molecular and periodic boundary conditions)

Spin Hamiltonian methods (numerical and analytical)

Coding (modern parallel Fortran, C++, Python)

High-Performance Computing (use of local and centralised infrastructure)

XRD (single crystal and powder, including use of synchrotron facilities and full refinement of data)

Standard analytical chemistry (IR, NMR, UV-Vis-IR, MS, TGA, HPLC, GC)

Education

2013 – 2015

Ph.D.

School of Chemistry, The University of Manchester, UK

Prof. E. J. L. McInnes and Prof. R. E. P. Winpenny

“Magnetic Anisotropy of Transition Metal Complexes”

2008 – 2011

B.Sc. Adv. Hons. (1st class)

School of Chemistry, Monash University, Australia

Prof. S. R. Batten and Prof. K. S. Murray

“Synthesis, Structure and Magnetic Anisotropy of Lanthanoid-Based Single Ion Magnets”.

Employment

2016 – current

Ramsay Memorial Fellow

School of Chemistry, The University of Manchester, UK

2016 – current

Research Fellow

School of Chemistry, The University of Manchester, UK

2015 – 2015

Post-Doctoral Research Associate

EPSRC EPR National Facility, The University of Manchester, UK

2012 – 2012

Research Assistant

School of Chemistry, Monash University, Australia

2008 – 2010

Research Assistant

School of Chemistry, Monash University, Australia

Student supervision

2016 – current **Ph.D.** School of Chemistry, The University of Manchester, UK

2016 – current **M.Chem.** The University of Manchester, UK

Awards

2016 – 2018 British Ramsay Memorial Fellowship, Ramsay Memorial Trust, UK

2016 Reaxys Ph.D. Prize Finalist

2015 Dalton Division Delegation to SILQCOM, Royal Society of Chemistry, UK

2015 Dalton Young Researchers Award, Royal Society of Chemistry, UK

2015 Young Scientist, 65th Lindau Nobel Laureates Meeting

2013 – 2015 President's Doctoral Scholar Award, The University of Manchester, UK

2011 Jubilee Honours Scholarship, Monash University, Australia

2008 Summer Research Scholarship, Monash University, Australia

Grants

2016 – 2018 Ramsay Memorial Trust "Wavefunction engineering in lanthanide complexes", UK

2016 – 2019 EPSRC (EP/P002560/1) "Designing Highly Axial Lanthanide Single Molecule Magnets", UK

2016 – 2019 EPSRC (EP/N007034/1) "Non-classical paramagnetic susceptibility and anisotropy in lanthanide coordination complexes: a combined experimental and theoretical study", UK

2013 NSCCS computational support, UK

2011 NCI computational support, Australia

Lectures

Invited: 2017 "Driving magnetic molecules", Bielefeld, Germany

Contributed: 2017 "European Conference on Molecular Magnetism", Bucharest, Romania

Tutorial: 2017 University of Glasgow, UK

Departmental: 2016 Aarhus University, Denmark

Contributed: 2016 "European Conference on Molecular Spintronics", Bologna, Italy

Invited: 2016 RSC Early Career Symposium, Glasgow, UK

RSC Award: 2016 University of Nottingham, UK

RSC Award: 2016 University of Glasgow, UK

RSC Award: 2016 University of Brighton, UK

RSC Award: 2016 University of Kent, UK

Contributed: 2015 "5th Latin American Symposium on Coordination and Organometallic Chemistry", Rio de Janeiro, Brazil

Departmental: 2015 Universidade Federal Fluminense, Brazil

Departmental: 2015 Universidade Federal do Rio de Janeiro, Brazil

Invited: 2015 "ThUL school on f-element chemistry", Karlsruhe, Germany

Invited: 2015 "International Conference on the f-Elements", Oxford, UK

Departmental: 2015 The University of Melbourne, Australia

Invited: 2014 "Functionalized molecule-based magnetic materials", Bielefeld, Germany

Departmental: 2014 CNRS Bordeaux, France

Invited: 2014 "International Conference on Molecule-Based Magnets", St. Petersburg, Russia

Departmental: 2014 University of Bath, UK

Contributed: 2014 "f-Element Workshop", Manchester, UK

Departmental: 2014 Univerisitat de Barcelona, Spain

Contributed: 2013 "European Conference on Molecular Magnetism", Karlsruhe, Germany

Publications

76. C. A. P. Goodwin, D. Reta, F. Ortu, N. F. Chilton and D. P. Mills, [Synthesis and Electronic Structures of Heavy Lanthanide Metallocenium Cations](#), *J. Am. Chem. Soc.*, 2017, doi: 10.1021/jacs.7b11535.
75. D. Reta, F. Ortu, S. Randall, D. P. Mills, N. F. Chilton, R. E.P. Winpenny, L. Natrajan, B. Edwards and N. Kaltsoyannis, [The performance of density functional theory for the description of ground and excited state properties of inorganic and organometallic uranium compounds](#), *J. Organomet. Chem.*, 2017, doi: 10.1016/j.jorganchem.2017.09.021.
74. G.-J. Zhou, T. Han, Y.-S. Ding, N. F. Chilton and Y.-Z. Zheng, [Metallacrowns as templates for diabolite-like {LnCu₈} complexes with nearly perfect square antiprismatic geometry](#), *Chem. Eur. J.*, 2017, **23**, 15617.
73. M. Vonci, K. Mason, E. A. Suturina, A. T. Frawley, S. G. Worswick, I. Kuprov, D. Parker, E. J. L. McInnes and N. F. Chilton, [Rationalisation of anomalous pseudo-contact shifts and their solvent dependence in a series of C₃-symmetric lanthanide complexes](#), *J. Am. Chem. Soc.*, 2017, **139**, 14166.
72. C. A. P. Goodwin, F. Ortu, D. Reta, **N. F. Chilton** and D. P. Mills, [Molecular magnetic hysteresis at 60 kelvin in dysprosocenium](#), *Nature*, 2017, **7668**, 349.
Highlighted in: *Nature News and Views*, 2017, **548**, 400; *Chem. Eng. News*, 2017, 95(35), 7 (News of the Week); Chemistry World; New Scientist; Phys.org; The Conversation; UoM In Abstract, Yahoo! News; Yahoo! Finance; Digital Trends; Controlled Environments; Storage Magazine; Nanowork Nanotechnology News; EurekAlert!; Science Newslines; Science Daily; Nanotechnology Now; R&D Magazine; Electronic Component News; Gizmag Emerging Technology Magazine; Discover Magazine; Computer Weekly; New Atlas; Singularity Hub; Space Daily; True Viral News; International Business Times; Long Room; Futurism; The Surg; Compound Interest; Cooling Zone; American Laboratory; World Industrial Reporter; Wall Street Pit; Scientific American (Italian Edition); La Nuova Sardegna; To Vima; Muy Interesante; Kurzweil AI; and, N + 1 (Russian Edition).
71. J. A. Seed, M. Gregson, F. Tuna, **N. F. Chilton**, A. J. Wooles, E. J. L. McInnes and S. T. Liddle, [Rare Earth- and Uranium-Mesoionic Carbenes: A New Class of f-Block Carbene Complex Derived from an N-Heterocyclic Olefin](#), *Angew. Chem. Int. Ed.*, 2017, doi: 10.1002/anie.201706546.
70. B. M. Gardner, D. M. King, F. Tuna, A. J. Wooles, **N. F. Chilton** and S. T. Liddle, [Assessing Crystal Field and Magnetic Interactions in Diuranium-μ-Chalcogenide Triamidoamine Complexes With UIV-E-UIV Cores \(E = S, Se, Te\): Implications for Determining the Presence or Absence of Actinide-Actinide Magnetic Exchange](#), *Chem. Sci.*, 2017, doi: 10.1039/C7SC01998J.
69. J. S. Uber, M. Estrader, J. Garcia, P. Lloyd-Williams, A. Sadurní, D. Dengler, J. van Slageren, **N. F. Chilton**, O. Roubeau, S. J. Teat, J. Ribas-Ariño and G. Aromí, [Molecules Designed to Contain Two Weakly Coupled Spins with a Photo-switchable Spacer](#), *Chem. Eur. J.*, 2017, doi: 10.1002/chem.201702171.
68. S. Sanz, H. M. O'Connor, V. Marti-Centelles, P. Comar, M. B. Pitak, S. J. Coles, G. Lorusso, E. Palacios, M. Evangelisti, A. Baldansuren, **N. F. Chilton**, H. Weihe, E. J. L. McInnes, P. J. Lusby, S. Piligkos and E. K. Brechin, [\[M^{III}₂M^{II}₃\]ⁿ⁺ trigonal bipyramidal cages based on](#)

[diamagnetic and paramagnetic metalloligands](#), *Chem. Sci.*, 2017, doi: 10.1039/C7SC00487G.

67. C. A. P. Goodwin, **N. F. Chilton**, L. S. Natrajan, M.-E. Boulon, J. W. Ziller, W. J. Evans and D. P. Mills, [Investigation into the Effects of a Trigonal-Planar Ligand Field on the Electronic Properties of Lanthanide\(II\) Tris\(silylamide\) Complexes \(Ln = Sm, Eu, Tm, Yb\)](#), *Inorg. Chem.*, 2017, **56**, 5959.
66. E. Loukopoulos, **N. F. Chilton**, A. Abdul-Sada and G. E. Kostakis, [Exploring the coordination capabilities of a family of flexible benzotriazole-based ligands using cobalt\(II\) sources](#), *Cryst. Growth Des.*, 2017, **17**, 2718.
65. E. Loukopoulos, M. Kallitsakis, N. Tsoureas, A. Abdul-Sada, **N. F. Chilton**, I. N. Lykakis and G. E. Kostakis, [Cu\(II\) coordination polymers as vehicles in the A³ coupling](#), *Inorg. Chem.*, 2017, **56**, 4898.
64. M.-E. Boulon, A. Fernandez, E. Moreno Pineda, N. F. Chilton, G. Timco, A. J. Fielding and R. E. P. Winpenny, [Measuring spin...spin interactions between heterospins in a hybrid \[2\]rotaxane](#), *Angew. Chem. Int. Ed.*, 2017, **56**, 3876.
63. F. Ortu, J. Liu, M. Burton, J. M. Fowler, A. Formanuk, M.-E. Boulon, **N. F. Chilton** and D. P. Mills, [Analysis of Lanthanide-Radical Magnetic Interactions in Ce\(III\) 2,2'-Bipyridyl Complexes](#), *Inorg. Chem.*, 2017, **56**, 2496.
62. T. Pugh, **N. F. Chilton** and R. A. Layfield, [Antimony-Ligated Dysprosium Single-Molecule Magnets as Catalysts for Stibine Dehydrocoupling](#), *Chem. Sci.*, 2017, **8**, 2073.
61. Y.-S. Ding, **N. F. Chilton**, R. E. P. Winpenny and Y.-Z. Zheng, [On Approaching The Limit of Molecular Magnetic Anisotropy: A Near-Perfect Pentagonal Bipyramidal Dy^{III} Single-Molecule Magnet](#), *Angew. Chem. Int. Ed.*, 2016, **55**, 16071.
60. Q.-W. Li, R.-C. Wan, Y.-C. Chen, J.-L. Liu, L.-F. Wang, J.-H. Jia, **N. F. Chilton** and M.-L. Tong, [Unprecedented Hexagonal Bipyramidal Single-Ion Magnets Based on Metallocrowns](#), *Chem. Commun.*, 2016, **52**, 13365.
59. D. M. King, P. A. Cleaves, A. J. Wooles, B. M. Gardner, **N. F. Chilton**, F. Tuna, W. Lewis, E. J. L. McInnes and S. T. Liddle, [Molecular and Electronic Structure of Terminal and Alkali Metal-Capped Uranium\(V\)-Nitride Complexes](#), *Nature Commun.*, 2016, **7**, 13773.
58. T. Pugh, **N. F. Chilton** and R. A. Layfield, [A Low-Symmetry Dysprosium Metallocene Single-Molecule Magnet with a High Anisotropy Barrier](#), *Angew. Chem. Int. Ed.*, 2016, **55**, 11082.
57. K. Griffiths, P. Kumar, G. Akien, **N. F. Chilton**, A. Abdul-Sada, G. J. Tizzard, S. Coles and G. E. Kostakis, [Tetranuclear 3d/4f coordination clusters as highly efficient catalysts for Friedel Crafts alkylation](#), *Chem. Commun.*, 2016, **52**, 7866.
56. C. A. P. Goodwin, **N. F. Chilton**, G. F. Vettese, E. M. Pineda, I. F. Crowe, J. W. Ziller, W. J. Evans and D. P. Mills, [Physicochemical properties of near-linear Ln\(II\) bis-silylamide complexes \(Ln = Sm, Eu, Tm, Yb\)](#), *Inorg. Chem.*, 2016, **55**, 10057.

55. J. P. S. Walsh, G. Bowling, A.-M. Ariciu, N. F. M. Jailani, **N. F. Chilton**, P. G. Waddell, D. Collison, F. Tuna and L. J. Higham, [Evidence of Slow Magnetic Relaxation in \$\text{Co}\(\text{AcO}\)_2\(\text{py}\)_2\(\text{H}_2\text{O}\)_2\$](#) , *Magnetochemistry*, 2016, **2**, 23.
54. J. J. Dunsford, D. J. Evans, T. Pugh, S. N. Shah, **N. F. Chilton** and M. J. Ingleson, [Three-Coordinate Iron\(II\) Expanded Ring N-heterocyclic Carbene Complexes](#), *Organometallics*, 2016, **35**, 1098.
53. J. O. Moilanen, **N. F. Chilton**, B. M. Day, T. Pugh and R. A. Layfield, [Strong Exchange Coupling in a Trimetallic Radical-Bridged Cobalt\(II\)-Hexaazatrinaphthalene Complex](#), *Angew. Chem. Int. Ed.*, 2016, **55**, 5521.
52. M. Gregson, **N. F. Chilton**, A.-M. Ariciu, F. Tuna, I. F. Crowe, W. Lewis, A. J. Blake, D. Collison, E. J. L. McInnes, R. E. P. Winpenny and S. T. Liddle, [A Monometallic Lanthanide Bis\(methanediide\) Single Molecule Magnet with a Large Energy Barrier and Complex Spin Relaxation Behaviour](#), *Chem. Sci.*, 2016, **7**, 155.
51. S. K. Langley, D. P. Wielechowski, **N. F. Chilton**, B. Moubaraki and K. S. Murray, [A Family of \$\{\text{Cr}^{\text{III}}_2\text{Ln}^{\text{III}}_2\}\$ Butterfly Complexes: Effect of the Lanthanide Ion on the Single-Molecule Magnet Properties](#), *Inorg. Chem.*, 2015, **54**, 10497.
50. S. K. Langley, **N. F. Chilton**, B. Moubaraki and K. S. Murray, [Single-molecule magnetism in \$\{\text{Co}^{\text{III}}_2\text{Dy}^{\text{III}}_2\}\$ -amine-polyalcohol-acetylacetonate complexes: Effects of ligand replacement at the \$\text{Dy}^{\text{III}}\$ sites on the dynamics of magnetic relaxation](#), *Inorg. Chem. Front.*, 2015, **2**, 867.
49. C. S. Hawes, **N. F. Chilton**, B. Moubaraki, G. P. Knowles, A. L. Chaffee, K. S. Murray, S. R. Batten and D. R. Turner, [Coordination polymers from a highly flexible alkyldiamine-derived ligand: structure, magnetism and gas adsorption studies](#), *Dalton Trans.*, 2015, **44**, 17494.
48. C.-Y. Lin, J.C. Fettinger, **N. F. Chilton**, A. Formanuk, F. Grandjean, G. J. Long, and P. P. Power, [Salts of the Two-Coordinate Homoleptic Manganese\(I\) Dialkyl Anion \$\[\text{Mn}\{\text{C}\(\text{SiMe}_3\)_3\}_2\]^-\$ with Quenched Orbital Magnetism](#), *Chem. Commun.*, 2015, **51**, 13275.
47. O. A. Blackburn, **N. F. Chilton**, K. Keller, C. E. Tait, W. K. Myers, E. J. L. McInnes, A. M. Kenwright, P. D. Beer, C. R. Timmel and S. Faulkner, [Spectroscopic and crystal field consequences of fluoride binding by \$\[\text{Yb.DTMA}\]^{3+}\$ in aqueous solution](#), *Angew. Chem. Int. Ed.*, 2015, **54**, 10783.
46. E. Moreno Pineda, **N. F. Chilton**, F. Tuna, R. E. P. Winpenny and E. J. L. McInnes, [Systematic Study of a Family of Butterfly-Like \$\{\text{M}_2\text{Ln}_2\}\$ Molecular Magnets \(\$\text{M} = \text{Mg}^{\text{II}}, \text{Mn}^{\text{III}}, \text{Co}^{\text{II}}, \text{Ni}^{\text{II}}\$, and \$\text{Cu}^{\text{II}}\$; \$\text{Ln} = \text{Y}^{\text{III}}, \text{Gd}^{\text{III}}, \text{Tb}^{\text{III}}, \text{Dy}^{\text{III}}, \text{Ho}^{\text{III}}\$, and \$\text{Er}^{\text{III}}\$ \)](#), *Inorg. Chem.*, 2015, **54**, 5930.
45. **N. F. Chilton**, H. Lei, A. M. Bryan, F. Grandjean, G. J. Long and P. P. Power, [Ligand Field Influence on the Electronic and Magnetic Properties of Quasi-Linear Two-Coordinate Iron\(II\) Complexes](#), *Dalton Trans.*, 2015, **44**, 11202.
44. B. M. Day, **N. F. Chilton** and R. A. Layfield, [Molecular and Electronic Structures of Donor-Functionalized Dysprosium Pentadienyl Complexes](#), *Dalton. Trans.*, 2015, **44**, 7109.

43. T. Rajeshkumar, H. V. Annadata, M. Evangelisti, S. K. Langley, **N. F. Chilton**, K. S. Murray and G. Rajaraman, [Theoretical Studies on Polynuclear \$\{Cu^{II}_5Gd^{III}_n\}\$ Clusters \(\$n = 4, 2\$ \): Towards Understanding Their Large Magnetocaloric Effect](#), *Inorg. Chem.*, 2015, **54**, 1661.
42. **N. F. Chilton**, [Design Criteria for High-Temperature Single-Molecule Magnets](#), *Inorg. Chem.*, 2015, **54**, 2097.
41. S. K. Langley, D. P. Wielechowski, V. Vieru, **N. F. Chilton**, B. Moubaraki, L. F. Chibotaru and K. S. Murray, [The first 4d/4f single molecule magnet containing a \$\{Ru^{III}_2Dy^{III}_2\}\$ core](#), *Chem. Commun.*, 2015, **51**, 2044.
40. **N. F. Chilton**, C. A. P. Goodwin, D. P. Mills and R. E. P. Winpenny, [The first near-linear bis\(amide\) f-block complex: a blueprint for a high temperature single molecule magnet](#), *Chem. Commun.*, 2015, **51**, 101.
39. E. Moreno Pineda, **N. F. Chilton**, R. Marx, M. Dörfel, D. O. Sells, P. Neugebauer, S.-D. Jiang, D. Collison, J. van Slageren, E. J. L. McInnes and R. E. P. Winpenny, [Direct measurement of dysprosium\(III\)–dysprosium\(III\) interactions in a single-molecule magnet](#), *Nat. Commun.*, 2014, **5**, 5243.
38. J. P. S. Walsh, S. Sproules, **N. F. Chilton**, A.-L. Barra, G. A. Timco, D. Collison, E. J. L. McInnes and R. E. P. Winpenny, [On the Possibility of Magneto-Structural Correlations: Detailed Studies of Dinickel Carboxylate Complexes](#), *Inorg. Chem.*, 2014, **53**, 8464.
37. S. Langley, D. Wielechowski, V. Vieru, **N. F. Chilton**, B. Moubaraki, L. F. Chibotaru and K. S. Murray, [Modulation of Slow Magnetic Relaxation by Tuning Magnetic Exchange in \$\{Cr_2Dy_2\}\$ Single Molecule Magnets](#), *Chem. Sci.*, 2014, **5**, 3246.
36. A. Jozwiuk, A. L. Ingram, D. R. Powell, B. Moubaraki, **N. F. Chilton**, K. S. Murray and R. P. Houser, [Redox and acid–base properties of asymmetric non-heme \(hydr\)oxo-bridged diiron complexes](#), *Dalton Trans.*, 2014, **43**, 9740.
35. S. K. Langley, L. Ungur, **N. F. Chilton**, B. Moubaraki, L. F. Chibotaru and K. S. Murray, [Single-Molecule Magnetism in a Family of \$\{Co^{II}2Dy^{III}2\}\$ Butterfly Complexes: Effects of Ligand Replacement on the Dynamics of Magnetic Relaxation](#), *Inorg. Chem.*, 2014, **53**, 4303.
34. S. A. Magee, S. Sproules, A.-L. Barra, G. A. Timco, **N. F. Chilton**, D. Collison, R. E. P. Winpenny and E. J. L. McInnes, [Large Zero-Field Splittings of the Ground Spin State Arising from Antisymmetric Exchange Effects in Heterometallic Triangles](#), *Angew. Chem. Int. Ed.*, 2014, **53**, 5310.
33. **N. F. Chilton**, G. B. Deacon, O. Gazukin, P. C. Junk, B. Kersting, S. K. Langley, B. Moubaraki, K. S. Murray, F. Schleife, M. Shome, D. R. Turner and J. A. Walker, [Structure, Magnetic Behavior, and Anisotropy of Homoleptic Trinuclear Lanthanoid 8-Quinolinolate Complexes](#), *Inorg. Chem.*, 2014, **53**, 2528.
32. C.-Y. Lin, J.-D. Guo, J. C. Fettinger, S. Nagase, F. Grandjean, G. J. Long, **N. F. Chilton** and P. P. Power, [Dispersion Force Stabilized Two-Coordinate Transition Metal–Amido Complexes of the \$-N\(SiMe_3\)Dipp\$ \(\$Dipp = C_6H_3-2,6-Pr'_2\$ \) Ligand: Structural, Spectroscopic, Magnetic, and Computational Studies](#), *Inorg. Chem.*, 2013, **52**, 13584.

31. G. F. S. Whitehead, J. Ferrando-Soria, L. G. Christie, **N. F. Chilton**, G. A. Timco, F. Moro and R. E. P. Winpenny, [The acid test: the chemistry of carboxylic acid functionalised {Cr₇Ni} rings](#), *Chem. Sci.*, 2014, **5**, 235.
30. S. K. Langley, **N. F. Chilton**, B. Moubaraki and K. S. Murray, [Magnetic properties of octa- and heptadeca-nuclear heterometallic Co^{II}-Ln^{III} complexes derived from the ligand 6-chloro-2-hydroxypyridine](#), *Poly.*, 2013, **66**, 48.
29. S. K. Langley, D. P. Wielechowski, V. Vieru, **N. F. Chilton**, B. Moubaraki, B. F. Abrahams, L. F. Chibotaru and K. S. Murray, [A Cr^{III}₂Dy^{III}₂ Single-Molecule Magnet: Enhancing the Blocking Temperature through 3d Magnetic Exchange](#), *Angew. Chem. Int. Ed.*, 2013, **52**, 12014.
28. **N. F. Chilton**, D. Collison, E. J. L. McInnes, R. E. P. Winpenny and A. Soncini, [An electrostatic model for the determination of magnetic anisotropy in dysprosium complexes](#), *Nat. Commun.*, 2013, **4**, 2551.
27. S. Koenig, **N. F. Chilton**, C. Maichle-moessmer, E. M. Pineda, T. Pugh, R. Anwender and R. A. Layfield, [Fast magnetic relaxation in an octahedral dysprosium tetramethyl-aluminate complex](#), *Dalton Trans.*, 2014, **43**, 3035.
26. M. E. Russell, C. S. Hawes, A. Ferguson, M. I. J. Polson, **N. F. Chilton**, B. Moubaraki, K. S. Murray and P. E. Kruger, [Synthesis, structural and magnetic characterisation of iron\(II/III\), cobalt\(II\) and copper\(II\) cluster complexes of the polytopic ligand: N-\(2-pyridyl\)-3-carboxypropanamide](#), *Dalton Trans.*, 2013, **42**, 13576.
25. H. S. Scott, T. M. Ross, **N. F. Chilton**, I. A. Gass, B. Moubaraki, G. Chastanet, N. Paradis, J.-F. Létard, K. R. Vignesh, G. Rajaraman, S. R. Batten and K. S. Murray, [Crown-linked dipyridylamino-triazine ligands and their spin-crossover iron\(II\) derivatives: magnetism, photomagnetism and cooperativity](#), *Dalton Trans.*, 2013, **42**, 16494.
24. S. K. Langley, **N. F. Chilton**, B. Moubaraki and K. S. Murray, [Anisotropy barrier enhancement via ligand substitution in tetranuclear {Co^{III}₂Ln^{III}₂} single molecule magnets](#), *Chem. Commun.*, 2013, **49**, 6965.
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22. I. A. Gass, S. Tewary, A. Nafady, **N. F. Chilton**, C. J. Gartshore, M. Asadi, D. W. Lupton, B. Moubaraki, A. M. Bond, J. F. Boas, S.-X. Guo, G. Rajaraman and K. S. Murray, [Observation of Ferromagnetic Exchange, Spin Crossover, Reductively Induced Oxidation, and Field-Induced Slow Magnetic Relaxation in Monomeric Cobalt Nitroxides](#), *Inorg. Chem.*, 2013, **52**, 7557.
21. S. K. Langley, **N. F. Chilton**, B. Moubaraki and K. S. Murray, [Single-Molecule Magnetism in Three Related {Co^{III}₂Dy^{III}₂}-Acetylacetonate Complexes with Multiple Relaxation Mechanisms](#), *Inorg. Chem.*, 2013, **52**, 7183.
20. **N. F. Chilton**, R. P. Anderson, L. D. Turner, A. Soncini and K. S. Murray, [PHI: A powerful new program for the analysis of anisotropic monomeric and exchange-coupled polynuclear d- and f-block complexes](#), *J. Comput. Chem.*, 2013, **34**, 1164.

19. M. R. Razali, **N. F. Chilton**, A. Urbatsch, B. Moubaraki, S. K. Langley, K. S. Murray, G. B. Deacon and S. R. Batten, [Trinuclear and tetranuclear manganese clusters derived from cyano\(imino\(methoxy\)methyl\)nitrosomethanide \(cmnm\)](#), *Poly.*, 2013, **52**, 797.
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17. M. Schmidt, D. Wiedemann, B. Moubaraki, **N. F. Chilton**, K. S. Murray, K. R. Vignesh, G. Rajaraman and A. Grohmann, [Iron\(II\) Complexes of Two Amine/Imine N₅ Chelate Ligands Containing a 1,4-Diazepane Core – To Crossover or Not To Crossover](#), *Eur. J. Inorg. Chem.*, 2013, **2013**, 958.
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