

## Joseph Paddison, PhD

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- Employment      **Oak Ridge National Laboratory, USA**      October 2019 to present  
Distinguished Staff Fellow (Eugene P. Wigner Fellow)
- Churchill College, University of Cambridge, UK**      October 2016 to Sept 2019  
Junior Research Fellow in Physics
- School of Physics, Georgia Institute of Technology, USA**      June 2015 to Sept 2016  
Postdoctoral Fellow in Physics  
• Mentor: Prof Martin Mourigal
- Education      **Department of Chemistry, University of Oxford, UK and STFC-ISIS, Rutherford Appleton Laboratory, UK**      October 2011 to July 2015  
DPhil in Inorganic Chemistry  
• Title: *Neutron-Scattering Studies of Frustrated Magnetic Materials*  
• Supervisors: Prof Andrew Goodwin and Dr Ross Stewart
- Wadham College, University of Oxford, UK**      September 2007 to July 2011  
MChem in Chemistry  
• Classification: 1st
- Barnard Castle School, UK**      September 2001 to May 2007
- Publications      1. Magnetic Excitations of the Classical Spin Liquid  $\text{MgCr}_2\text{O}_4$   
X Bai, **J A M Paddison**, E Kapit, S M Koochpayeh, J-J Wen, S E Dutton, A T Savici, Al Kolesnikov, G E Granroth, C L Broholm, J T Chalker, and M Mourigal  
*Phys Rev Lett* **122**, 097201 (2019)
2. Ultrafast Calculation of Diffuse Scattering from Atomistic Models  
**J A M Paddison**  
*Acta Crystallographica A* **75**, 14-24 (2019)
3. Hierarchy of Exchange Interactions in the Triangular-Lattice Spin-Liquid  $\text{YbMgGaO}_4$   
X Zhang, F Mahmood, M Daum, Z L Dun, **J A M Paddison**, N J Laurita, T Hong, H D Zhou, N P Armitage, and M Mourigal  
*Phys Rev X* **8**, 031001 (2018)
4. Magnetic Structure of Paramagnetic MnO  
**J A M Paddison**, M J Gutmann, J R Stewart, M G Tucker, M T Dove, D A Keen, and A L Goodwin  
*Phys Rev B* **97**, 014429 (2018)
5. Low-Dimensional Quantum Magnetism in  $\text{Cu}(\text{NCS})_2$ : A Molecular Framework Material  
M J Cliffe, J Lee, **J A M Paddison**, S Schott, P Mukherjee, M W Gaultois, P Manuel, H Sirringhaus, S E Dutton, and C P Grey  
*Phys Rev B* **97** 144421 (2018)
6. Continuous Excitations of the Triangular-Lattice Quantum Spin Liquid  $\text{YbMgGaO}_4$   
**J A M Paddison**, M Daum, Z L Dun, G Ehlers, Y Liu, M B Stone, H D Zhou, and M Mourigal  
*Nature Physics* **13**, 117 (2017) [Web of Science Highly Cited Paper \(Top 1% in its academic field\)](#); [Phys.org](#); [Science Bulletin](#)

7. Orbital Dimer Model for the Spin-Glass State in  $Y_2Mo_2O_7$   
P M M Thygesen, **J A M Paddison**, R Zhang, K A Beyer, K W Chapman, H Y Playford, M G Tucker, D A Keen, M A Hayward, and A L Goodwin  
*Phys Rev Lett* **118**, 067201 (2017)
8. Spin Order and Dynamics in the Diamond-Lattice Heisenberg Antiferromagnets  $CuRh_2O_4$  and  $CoRh_2O_4$   
L Ge, J Flynn, **J A M Paddison**, M B Stone, S Calder, M A Subramanian, A P Ramirez, and M Mourigal  
*Phys Rev B* **96**, 064413 (2017) [Editors' Suggestion](#)
9. Spin Correlations in the Dipolar Pyrochlore Antiferromagnet  $Gd_2Sn_2O_7$   
**J A M Paddison**, G Ehlers, O A Petrenko, A R Wildes, J S Gardner, and J R Stewart  
*J Phys: Condens Matter* **29**, 144001 (2017) ["Emerging Leaders" Special Issue](#)
10. Emergent Order in the Kagome Ising Magnet  $Dy_3Mg_2Sb_3O_{14}$   
**J A M Paddison**, H S Ong, J O Hamp, P Mukherjee, X Bai, M G Tucker, N P Butch, C Castelnovo, M Mourigal, and S E Dutton  
*Nature Communications* **7**, 13842 (2016)
11. Encoding Complexity Within Supramolecular Analogues of Frustrated Magnets  
A B Cairns, M J Cliffe, **J A M Paddison**, D Daisenberger, M G Tucker, F-X Coudert, and A L Goodwin  
*Nature Chemistry* **8**, 442 (2016) [Nature Chemistry News and Views](#)
12. Hidden Order in Spin-Liquid  $Gd_3Ga_5O_{12}$   
**J A M Paddison**, H Jacobsen, O A Petrenko, M T Fernández-Díaz, P P Deen, and A L Goodwin  
*Science* **350**, 179 (2015) [Phys.org](#)
13. Searching Beyond Gd for Magnetocaloric Frameworks: Magnetic Properties and Interactions of the  $Ln(HCO_2)_3$  Series  
P J Saines, **J A M Paddison**, P M M Thygesen, and M G Tucker  
*Materials Horizons* **2**, 528 (2015)
14. Spin Correlations in  $Ca_3Co_2O_6$ : Polarized-Neutron Diffraction and Monte Carlo Study  
**J A M Paddison**, S Agrestini, M R Lees, C L Fleck, P P Deen, A L Goodwin, J R Stewart, and O A Petrenko  
*Phys Rev B* **90**, 014411 (2014)
15. Liquidlike Correlations in Single-Crystalline  $Y_2Mo_2O_7$ : An Unconventional Spin Glass  
H J Silverstein, K Fritsch, F Flicker, A M Hallas, J S Gardner, Y Qiu, G Ehlers, A T Savici, Z Yamani, K A Ross, B D Gaulin, M J P Gingras, **J A M Paddison**, K Foyevtsova, R Valenti, F Hawthorne, C R Wiebe, and H D Zhou  
*Phys Rev B* **89**, 054433 (2014)
16. Spinvert: A Program for Refinement of Paramagnetic Diffuse Scattering Data  
**J A M Paddison**, J R Stewart, and A L Goodwin  
*J Phys: Condens Matter* **25**, 454220 (2013)
17. Emergent Frustration in Co-doped  $\beta$ -Mn  
**J A M Paddison**, J R Stewart, P Manuel, P Courtois, G J McIntyre, B D Rainford, and A L Goodwin  
*Phys Rev Lett* **110**, 267207 (2013) [STFC-ISIS Highlight](#)
18. Statics and Dynamics of the Highly Correlated Spin Ice  $Ho_2Ge_2O_7$   
A M Hallas, **J A M Paddison**, H J Silverstein, A L Goodwin, J R Stewart, A R Wildes, J G Cheng, J S Zhou, J B Goodenough, E S Choi, G Ehlers, J S Gardner, C R Wiebe, and H D Zhou  
*Phys Rev B* **86**, 134431 (2012)
19. Empirical Magnetic Structure Solution of Frustrated Spin Systems  
**J A M Paddison** and A L Goodwin  
*Phys Rev Lett* **108**, 017204 (2012) [Cover of Bluesci magazine](#)

#### Preprints

1. Modeling Spin Dynamics in the Singlet Ground State Garnet  $Ho_3Ga_5O_{12}$   
**J A M Paddison**, P Mukherjee, X Bai, Z L Dun, C R Wiebe, H D Zhou, J S Gardner, M Mourigal, and S E Dutton  
*arXiv:1908.03530* (2019)

2. Quantum Spin Fragmentation in Kagome Ice  $\text{Ho}_3\text{Mg}_2\text{Sb}_3\text{O}_{14}$   
Z L Dun, X Bai, **J A M Paddison**, N P Butch, C D Cruz, M B Stone, T Hong, M Mourigal, and H D Zhou  
*arXiv:1806.04081* (2018)
3. Nature of Partial Magnetic Order in the Frustrated Antiferromagnet  $\text{Gd}_2\text{Ti}_2\text{O}_7$   
**J A M Paddison**, A B Cairns, D D Khalyavin, P Manuel, A Daoud-Aladine, G Ehlers, O A Petrenko, J S Gardner, H D Zhou, A L Goodwin, and J R Stewart  
*arxiv:1506.05045* (2015)

Software authored	<ul style="list-style-type: none"> <li>• Spinvert: A program for refinement of paramagnetic diffuse-scattering data. Available at <a href="http://spinvert.chem.ox.ac.uk">http://spinvert.chem.ox.ac.uk</a></li> <li>• Scatty: A program for ultrafast calculation of diffuse scattering from atomistic models. Available at <a href="http://paddisongroup.wordpress.com/software/">http://paddisongroup.wordpress.com/software/</a></li> </ul>
Invited seminars given	<ul style="list-style-type: none"> <li>• Theoretical and Experimental Magnetism Meeting, Abingdon, UK, 17–19 July 2019 (also 2018, 2017, 2013, and 2012)</li> <li>• ORNL Neutron Scattering User Meeting &amp; Diffuse Scattering Workshop, Oak Ridge, TN, USA, 4–7 June 2019</li> <li>• Condensed Matter Physics Seminar, University of Warwick, Coventry, UK, 30 April 2019</li> <li>• ADD2019: School and Conference on Analysis of Diffraction Data in Real Space, Grenoble, France, 17–22 March 2019</li> <li>• APS March Meeting, Boston, MA, USA, 4–8 March 2019</li> <li>• Institut Laue-Langevin and European Spallation Source User Meeting, Grenoble, France, 10 Oct 2018</li> <li>• Institute for Quantum Matter, Johns Hopkins University, Baltimore, MD, USA, 14 Jan 2019</li> <li>• High Field Magnet Laboratory, University of Nijmegen, Netherlands, 12 April 2018</li> <li>• Centre for Science at Extreme Conditions, University of Edinburgh, UK, 15 Feb 2018</li> <li>• Solid-State Seminar, Department of Chemistry, University of Oxford, UK, 12 Jan 2018</li> <li>• School of Physics and Astronomy, Queen Mary University of London, UK, 21 Nov 2017</li> <li>• ISIS/Diamond Seminar, Rutherford Appleton Laboratory, Didcot, UK, 25 Oct 2017</li> <li>• Triennial Congress of the International Union of Crystallography, Hyderabad, India, 21–28 Aug 2017</li> <li>• S N Bose National Centre for Basic Sciences, Kolkata, India, 18 Aug 2017</li> </ul>
Awards	<ul style="list-style-type: none"> <li>• (2017) European Physical Society Early Career Prize</li> <li>• (2016) Highly Frustrated Magnetism Conference poster prize</li> <li>• (2014) STFC-ISIS (UK) student presentation prize</li> <li>• (2012) Institute of Physics (UK) poster prize</li> <li>• (2011) Inorganic Chemistry Part II thesis prize, University of Oxford, UK</li> </ul>
Teaching	<ul style="list-style-type: none"> <li>• (Sept 2019) Lectured and led workshop at SISN Advanced School on Neutrons and Muons for Magnetism, Ispra, Italy</li> <li>• (Oct 2018–July 2019) Academic lead supervisor of 1-year undergraduate student project</li> <li>• (Mar 2019) Lectured and led workshops at ADD2019: School and Conference on Analysis of Diffraction Data in Real Space, Grenoble, France</li> <li>• (July 2018) Lectured at Summer School “Polarised Neutrons for Condensed-Matter Investigations”, Rutherford Appleton Laboratory, UK</li> <li>• (2017–2018) Small-group teaching of “Electrons in Solids” Chemistry course to 2nd-year undergraduates</li> <li>• (Sept 2016) Lectured at Summer School “Highly Frustrated Magnetism”, Taipei, Taiwan</li> <li>• (Oct 2016–Sept 2019) Involved in mentoring 2 graduate students as JRF at Cambridge</li> </ul>
Funding	<ul style="list-style-type: none"> <li>• (Jan 2017–present) Awarded 61 days of experimental time at central facilities, including 11 days of beam-time in 2017 at the ISIS Neutron Source with a value of £209,880</li> <li>• (Feb 2018) Funded as academic lead supervisor for student placement at Institut Laue-Langevin, Grenoble, France</li> </ul>
Professional activities	<ul style="list-style-type: none"> <li>• Reviewer for <i>Nature Communications</i>, <i>Physical Review X</i>, <i>Physical Review Letters</i>, <i>Physical Review B</i>, <i>Annalen der Physik</i>, and <i>Acta Crystallographica Section A</i></li> <li>• (2018–present) Member, MLZ Review Panel</li> <li>• (2017–present) Member, STFC-ISIS Facility Access Panel</li> <li>• (2016) Reviewer, US D.O.E. Office of Basic Energy Sciences</li> </ul>