

JAMES P. S. WALSH

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RESEARCH POSITIONS

Postdoctoral Fellow with Prof Danna Freedman **May 2015 – Present**
Northwestern University, USA
Project: High-pressure synthesis of novel materials for emergent properties

Postdoctoral Fellow with Dr Jacob Overgaard **Feb 2015 – May 2015**
Aarhus University, Denmark
Project: Spin density in molecular nanomagnets from neutron and X-ray diffraction

EDUCATION

PhD in Inorganic Chemistry **Sep 2010 – Dec 2014**
Nanoscience Doctoral Training Centre, University of Manchester, UK
Advisors: Prof David Collison, Prof Eric McInnes, and Prof Richard Winpenny
Project: Magnetic and spectroscopic studies of anisotropy in molecular nanomagnets

MChem in Chemistry with Forensic Science **Sep 2006 – Jun 2010**
University of Manchester, UK
Project: Negative thermal expansion within metal-organic frameworks

HONOURS AND AWARDS

COMPRES Postdoc Travel Scholarship (*Annual Meeting, Santa Ana Pueblo, New Mexico, USA*) **Aug 2018**
IUCr-HP Early Career Travel Award (*IUCr Commission on High-Pressure, Honolulu, Hawai'i, USA*) **Jul 2018**
Northwestern Postdoctoral Professional Development Travel Award **Dec 2017**
International Institute for Nanotechnology Outstanding Researcher Award **Sep 2017**
COMPRES Postdoc Travel Scholarship (*Annual Meeting, Santa Ana Pueblo, New Mexico, USA*) **Jul 2017**
Marie Skłodowska-Curie Masterclass Invited Participant (*Aarhus University, Denmark*) **May 2016**

INVITED TALKS

Materials in Extreme Environments at ACS Fall 2018 (*Boston, Massachusetts, USA*) **Aug 2018**
Workshop of the IUCr Commission on High-Pressure (*Honolulu, Hawai'i, USA*) **Jul 2018**
Special Seminar (*Michigan State University, Michigan, USA*) **Jan 2018**
HPCAT Beamline Review (*Advanced Photon Source, Illinois, USA*) **Nov 2017**
Workshop on Probing Materials Under Extreme Conditions (*Advanced Photon Source, Illinois, USA*) **Oct 2017**
Nuclear Resonant Scattering and Data Analysis Workshop (*Argonne National Laboratory, Illinois, USA*) **Nov 2016**
Gordon Research Seminar: Research at High Pressure (*Holderness School, Plymouth, New Hampshire, USA*) **Jul 2016**

TEACHING EXPERIENCE

Guest Lecturer, Graduate Inorganic Chemistry **2017 – Present**
Northwestern University, USA

Laboratory Demonstrator (Teaching Assistant), Inorganic Synthesis **2011 – 2013**
University of Manchester, UK

PUBLICATIONS

- 24. Discovery of Cu₃Pb**
Tamerius, A. D.; Clarke, S. M.; Gu, M.; Walsh, J. P. S.; Esters, M.; Meng, Y.; Hendon, C. H.; Rondinelli, J. M.; Jacobsen, S. D.; Freedman, D. E. *Angew. Chem., Int. Ed.*, **2018**.
- 23. Impact of pressure on magnetic order in jarosite**
Klein, R. A.; Walsh, J. P. S.; Clarke, S. M.; Guo, Y.; Bi, W.; Fabbris, G.; Meng, Y.; Haskel, D.; Alp, E. E.; Van Duyne, R. P.; Jacobsen, S. D.; Freedman, D. E. *J. Am. Chem. Soc.*, **2018**.
- 22. High-pressure synthesis: A new frontier in the search for next-generation intermetallic compounds**
Walsh, J. P. S.; Freedman, D. E. *Acc. Chem. Res.*, **2018**, *51*, 1315–1323.
- 21. Evidence of spin canting, metamagnetism, negative coercivity and slow relaxation in a two-dimensional network of {Mn₆} cages**
Dendrinou-Samara, C.; Walsh, J. P. S.; Muryu, C. A.; Collison, D.; Winpenny, R. E. P.; Tuna, F. *Eur. J. Inorg. Chem.*, **2018**, 485–492.
- 20. Molecular single-ion magnets based on lanthanides and actinides: Design considerations and new advances in the context of quantum technologies**
McAdams, S. G.; Ariciu, A.-M.; Kostopoulos, A. K.; Walsh, J. P. S.; Tuna, F. *Coord. Chem. Rev.*, **2017**, *346*, 216–239.
- 19. Creating binary Cu–Bi compounds via high-pressure synthesis: A combined experimental and theoretical study**
Clarke, S. M.; Amsler, M.; Walsh, J. P. S.; Yu, T.; Wang, Y.; Meng, Y.; Jacobsen, S. D.; Wolverton, C.; Freedman, D. E. *Chem. Mater.*, **2017**, *29*, 5276–5285.
- 18. Discovery of FeBi₂**
Walsh, J. P. S.; Clarke, S. M.; Wang, Y.; Jacobsen, S. D.; Freedman, D. E. *ACS Cent. Sci.*, **2016**, *2*, 867–871.
This paper was highlighted in the following articles:
(a) Fredrickson, D. "A pressurized exploration of intermetallic chemistry." *ACS Cent. Sci.*, **2016**, *2*, 773–774.
(b) Szuromi, P. "Forcing iron to bond to bismuth." *Science*, **2016**, *354*, 1246–1247.
- 17. Using Supramolecular Chemistry to Build Quantum Logic Gates (Preview Article)**
Walsh, J. P. S.; Freedman, D. E. *Chem*, **2016**, *1*, 668–669.
- 16. Oximate-bridged copper(II) compounds: Syntheses, molecular structures, magnetic, thermal and spectroscopic properties**
Naskar, J. P.; Biswas, C.; Bandyopadhyay, N.; Walsh, J. P. S.; Tuna, F.; Zhu, M.; Lu, L. *J. Coord. Chem.*, **2016**, *69*, 2329–2341.
- 15. Evidence of slow magnetic relaxation in Co(AcO)₂(py)₂(H₂O)₂**
Walsh, J. P. S.; Bowling, G.; Ariciu, A.-M.; Jailani, N. F. M.; Chilton, N. F.; Waddell, P. G.; Collison, D.; Tuna, F.; Higham, L. *J. Magnetochemistry*, **2016**, *2*, 23.
- 14. Dioxygen binding at a four-coordinate cobaltous porphyrin site in a metal–organic framework: structural, EPR, and O₂ adsorption analysis**
Gallagher, A. T.; Kelty, M. L.; Park, J. G.; Anderson, J. S.; Mason, J. A.; Walsh, J. P. S.; Collins, S. L.; Harris, T. D. *Inorg. Chem. Front.*, **2016**, *3*, 536–540.
- 13. Magnetism and variable temperature and pressure crystal structures of a linear oligonuclear cobalt bis-semiquinonate**
Overgaard, J.; Møller, L. H.; Borup, M. A.; Tricoire, M.; Walsh, J. P. S.; Diehl, M.; Rentschler, E. *Dalton. Trans.*, **2016**, *45*, 12924–12932.

12. **Discovery of a superconducting Cu–Bi intermetallic compound via high-pressure synthesis**
Clarke, S. M.; Walsh, J. P. S.; Amsler, M.; Malliakas, C. D.; Yu, T.; Goedecker, S.; Wang, Y.; Wolverton, C.; Freedman, D. E. *Angew. Chem., Int. Ed.*, **2016**, *55*, 13446–13449.
11. **Electronic structure of a mixed-metal fluoride-centered triangle complex: A potential qubit component**
Walsh, J. P. S.; Meadows, S. B.; Ghirri, A.; Moro, F.; Jennings, M.; Smith, W. F.; Graham, D. M.; Kihara, T.; Nojiri, H.; Vitorica-Yrezabal, I. J.; Timco, G. A.; Collison, D.; McInnes, E. J. L.; Winpenny, R. E. P. *Inorg. Chem.*, **2015**, *54*(24), 12019–12026.
10. **Hexanuclear 3d–4f neutral Co₂Ln^{III} clusters: Synthesis, structure, and magnetism**
Goura, J.; Chakraborty, A.; Walsh, J. P. S.; Tuna, F.; Chandrasekhar, V. *Cryst. Growth Des.*, **2015**, *15*(7), 3157–3165.
9. **P–C bond cleavage-assisted lanthanide phosphate coordination polymers**
Goura, J.; Walsh, J. P. S.; Tuna, F.; Halder, R.; Maji, T. K.; Chandrasekhar, V. *Cryst. Growth Des.*, **2015**, *15*(6), 2555–2560.
8. **Discrete and polymeric cobalt organophosphates: isolation of a 3-D cobalt phosphate framework exhibiting selective CO₂ capture**
Gupta, S. K.; Kuppaswamy, S.; Walsh, J. P. S.; McInnes, E. J. L.; Murugavel, R. *Dalton Trans.*, **2015**, *44*, 5587–5601.
7. **A synthetic strategy for switching the single ion anisotropy in tetrahedral Co(II) complexes**
Vaidya, S.; Upadhyay, A.; Kumar Singh, S.; Gupta, T.; Tewary, S.; Langley, S. K.; Walsh, J. P. S.; Murray, K. S.; Rajaraman, G.; Shanmugam, M. *Chem. Comm.*, **2015**, *51*, 3739–3742.
6. **Structural, magnetic and catalytic properties of cobalt chromite obtained through precursor method**
Gingasu, D.; Mandru, I.; Culita, D. C.; Patron, L.; Calderon-Moreno, J.-M.; Osiceanu, P.; Preda, S.; Oprea, O.; Parvulescu, V.; Teodorescu, V.; Walsh, J. P. S. *Mater. Res. Bull.*, **2015**, *62*, 52–64.
5. **Self-assembly of a 3d–5f trinuclear single-molecule magnet from a pentavalent uranyl complex**
Chatelain, L.; Walsh, J. P. S.; Pécaut, J.; Tuna, F.; Mazzanti, M. *Angew. Chem.*, **2014**, *53*(49), 13434–13438.
5. **Synthesis, structure, and magnetism of non-planar heptanuclear lanthanide(III) complexes**
Goura, J.; Walsh, J. P. S.; Tuna, F.; Chandrasekhar, V. *Dalton Trans.*, **2014**, *44*, 1142–1149.
3. **Relationships between electron density and magnetic properties in water-bridged dimetal complexes**
Overgaard, J.; Walsh, J. P. S.; Hathwar, V. R.; Jørgensen, M. R. V.; Hoffman, C.; Platts, J. A.; Piltz, R.; Winpenny, R. E. P. *Inorg. Chem.*, **2014**, *53*(21), 11531–11539.
2. **On the possibility of magneto-structural correlations: Detailed studies of dinickel carboxylate complexes**
Walsh, J. P. S.; Sproules, S.; Chilton, N. F.; Barra, A.-L.; Timco, G. A.; Collison, D.; McInnes, E. J. L.; Winpenny, R. E. P. *Inorg. Chem.*, **2014**, *53*(16), 8464–8472.
1. **Tetranuclear lanthanide(III) complexes in a seesaw geometry: Synthesis, structure, and magnetism**
Goura, J.; Walsh, J. P. S.; Tuna, F.; Chandrasekhar, V. *Inorg. Chem.*, **2014**, *53*(7), 3385–3391.

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