James P. S. Walsh

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APPOINTMENTS

Associate Professor — Sep. 2025 – Present
University of Massachusetts Amherst — *Amherst, Massachusetts, United States*

Assistant Professor — Sep. 2019 – Aug. 2025
University of Massachusetts Amherst — *Amherst, Massachusetts, United States*

Postdoctoral Fellow — May 2015 – Aug. 2019
Northwestern University · Advisor: Prof. Danna Freedman — *Evanston, Illinois, United States*

Postdoctoral Fellow — Mar. 2015 – May 2015
Aarhus University · Advisor: Dr. Jacob Overgaard — *Aarhus, Denmark*

Research Associate — Nov. 2014 – Feb. 2015
University of Manchester · Advisor: Dr. Alistair Fielding — *Manchester, United Kingdom*

EDUCATION

PhD in Inorganic Chemistry — Sep. 2010 – Oct. 2014
University of Manchester · Advisor: Prof. David Collison — *Manchester, United Kingdom*

Master's in Chemistry — Sep. 2006 – Aug. 2010
University of Manchester · Focus: Forensic Science — *Manchester, United Kingdom*

AWARDS AND HONORS

Lilly Teaching Fellowship *(University of Massachusetts Amherst)* — Apr. 2024
CAREER Award *(National Science Foundation)* — Dec. 2022
IIN Outstanding Researcher Award *(Northwestern University)* — Sep. 2017

PUBLICATIONS

Independent Research:

(1) **High-pressure synthesis of a novel body-centered tetragonal vanadium carbide**
Cote, E. E., Nelson, T. L., Ambos, S. D., Arigbede, J., Walsh, C., Bernard, R. E., Brooks, H. L., Whitaker, M. L., **Walsh, J. P. S.**, *Chem. – Eur. J.* **2026**, e202502753.

(2) **Stability of the fcc phase in shocked nickel up to 332 GPa**
Pereira, K. A., Clarke, S. M., Singh, S., Briggs, R., McGuire, C. P., Lee, H. J., Khaghani, D., Nagler, B., Galtier, E., Cunningham, E., *Nat. Commun.* **2025**, *16*, 4385.

(3) **Fragmenting the kagomé lattice: Pressure-tuned anisotropy of Cu^{2+} triangles in a novel atacamite relative, $CaCu(OH)_3Cl$**
Ambos, S. D., Manganaro, N. S., DeCapua, M., Zhang, D., Nguyen, P. Q., Yan, J., **Walsh, J. P.**, *J. Phys. Chem. C* **2024**, *129*, 4226–4232.

(4) **Shock compression experiments using the DiPOLE 100-X laser on the high energy density instrument at the European x-ray free electron laser: Quantitative structural analysis of liquid Sn**
Gorman, M. G. *J. Appl. Phys.* **2024**, *135*, 165902.

(5) **High-pressure polymorphism in silver ferrite delafossite, $AgFeO_2$**
Manganaro, N. S., Ambos, S. D., DeCapua, M., Thiel, S. D., Mitchell, W. E., Liu, Z., Zhang, D., Nguyen, P. Q. H., Lavina, B., Alp, E. E., Yan, J., **Walsh, J. P. S.**, *Inorg. Chem.* **2024**, *63*, 9763–9770.

(6) **High-pressure synthesis and recovery of single crystals of the metastable manganese carbide, MnC_x**
Marshall, P. V., Thiel, S. D., Cote, E. E., Arigbede, J., Whitaker, M. L., **Walsh, J. P. S.**, *Chem. – Eur. J.* **2024**, *30*, e202401581.

(7) **Combined first-principles and experimental investigation into the reactivity of codeposited chromium–carbon under pressure**
Marshall, P. V., Thiel, S. D., Cote, E. E., Hrubiak, R., Whitaker, M. L., Meng, Y., **Walsh, J. P. S.**, *ACS Mater. Au* **2023**, *4*, 393–402.

(8) **Designing magnetic properties in CrSBr through hydrostatic pressure and ligand substitution**
Telford, E. J., Chica, D. G., Ziebel, M. E., Xie, K., Manganaro, N. S., Huang, C.-Y., Cox, J., Dismukes, A. H., Zhu, X., **Walsh, J. P. S.**, Cao, T., Dean, C. R., Roy, X., *Adv. Physics Res.* **2023**, *2*, 2300036.

(9) **X-ray diffraction methods for high-pressure solid-state synthesis**
Thiel, S. D., Tamarius, A. D., **Walsh, J. P. S.**, *Compr. Inorg. Chem. III* **2023**, 220–221.

(10) **First-principles investigation of phase stability in substoichiometric zirconium carbide under high pressure**
Thiel, S. D., **Walsh, J. P. S.**, *Adv. Theory Simul.* **2022**, *5*, 2200439.

(11) **Anisotropic structural collapse of Mg_3Sb_2 and Mg_3Bi_2 at high pressure**
Calderón-Cueva, M., Peng, W., Clarke, S. M., Ding, J., Brugman, B. L., Levental, G., Balodhi, A., Rylko, M., Delaire, O., **Walsh, J. P. S.**, Dorfman, S. M., Zevalkink, A., *Chem. Mater.* **2021**, *33*, 567–573.

(12) **High-pressure synthesis of bulk cobalt cementite, Co_3C**
Marshall, P. V., Alptekin, Z., Thiel, S. D., Smith, D., Meng, Y., **Walsh, J. P. S.**, *Chem. Mater.* **2021**, *33*, 9601–9607.

(13) **'Pink'-beam X-ray powder diffraction profile and its use in Rietveld refinement**
Von Dreele, R. B., Clarke, S. M., **Walsh, J. P. S.**, *J. Appl. Crystallogr.* **2021**, *54*, 3–6.

Doctoral and Postdoctoral Research:

(1) **NMR study of spin dynamics in V_7Zn and V_7Ni molecular rings**
Adelnia, F., Arosio, P., Mariani, M., Orsini, F., Radaelli, A., Sangregorio, C., Borsa, F., **Walsh, J. P. S.**, Winpenny, R. E. P., Timco, G. A., Lascialfari, A., *Appl. Magn. Reson.* **2020**, *51*, 1277–1293.

(2) **Computationally directed discovery of $MoBi_2$**
Altman, A. B., Tamerius, A. D., Koocher, N. Z., Meng, Y., Pickard, C. J., **Walsh, J. P. S.**, Rondinelli, J. M., Jacobsen, S. D., Freedman, D. E., *J. Am. Chem. Soc.* **2020**, *143*, 214–222.

(3) **Pressure-induced collapse of magnetic order in jarosite**
Klein, R. A., **Walsh, J. P. S.**, Clarke, S. M., Liu, Z., Alp, E. E., Bi, W., Meng, Y., Altman, A. B., Chow, P., Xiao, Y., Norman, M. R., Rondinelli, J. M., Jacobsen, S. D., Puggioni, D., Freedman, D. E., *Phys. Rev. Lett.* **2020**, *125*.

(4) **Controlling dimensionality in the Ni–Bi system with pressure**
Clarke, S. M., Powderly, K. M., **Walsh, J. P. S.**, Yu, T., Wang, Y., Meng, Y., Jacobsen, S. D., Freedman, D. E., *Chem. Mater.* **2019**, *31*, 955–959.

(5) **High-pressure synthesis of the $BiVO_3$ perovskite**
Klein, R. A., Altman, A. B., Saballos, R. J., **Walsh, J. P. S.**, Tamerius, A. D., Meng, Y., Puggioni, D., Jacobsen, S. D., Rondinelli, J. M., Freedman, D. E., *Phys. Rev. Mater.* **2019**, *3*.

(6) **Goldschmidtite, (K, REE, Sr)(Nb, Cr)O_3: A new perovskite supergroup mineral found in diamond from Koffiefontein, South Africa**
Meyer, N. A., Wenz, M. D., **Walsh, J. P. S.**, Jacobsen, S. D., Locock, A. J., Harris, J. W., *Am. Mineral.* **2019**, *104*, 1345–1350.

(7) **Insights into single-molecule-magnet behavior from the experimental electron density of linear two-coordinate iron complexes**
Thomsen, M., Nyvang, A., **Walsh, J.**, Bunting, P., Long, J., Neese, F., Atanasov, M., Genoni, A., Overgaard, J., *Inorg. Chem.* **2019**, *58*, 3211–3218.

(8) **$MnBi_2$: A metastable high-pressure phase in the Mn–Bi system**
Walsh, J. P. S., Clarke, S. M., Puggioni, D., Tamerius, A. D., Meng, Y., Rondinelli, J. M., Jacobsen, S. D., Freedman, D. E., *Chem. Mater.* **2019**, *31*, 3083–3088.

(9) **Evidence of spin canting, metamagnetism, negative coercivity and slow relaxation in a two-dimensional network of $\{Mn_6\}$ cages**
Dendrinou-Samara, C., **Walsh, J. P. S.**, Muryn, C. A., Collison, D., Winpenny, R. E. P., Tuna, F., *Eur. J. Inorg. Chem.* **2018**, *2018*, 485–492.

(10) **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**, *140*, 12001–12009.

(11) **Discovery of Cu_3Pb**
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.* **2018**, *57*, 12809–12813.

(12) **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.

(13) **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.

(14) **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.

(15) **Discovery of a superconducting Cu–Bi intermetallic compound by 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.* **2016**, *55*, 13446–13449.

(16) **Dioxygen binding at a four-coordinate cobaltous porphyrin site in a metal-organic framework: Structural, EPR, and O_2 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.

(17) **Oximato-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., *Journal of Coordination Chemistry* **2016**, *69*, 2329–2341.

(18) **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.

(19) **Discovery of $FeBi_2$**
Walsh, J. P. S., Clarke, S. M., Meng, Y., Jacobsen, S. D., Freedman, D. E., *ACS Cent. Sci.* **2016**, *2*, 867–871.

(20) **Using supramolecular chemistry to build quantum logic gates**
Walsh, J. P. S., Freedman, D. E., *Chem* **2016**, *1*, 668–669.

(21) **Evidence of slow magnetic relaxation in $Co(AcO)_2(py)_2(H_2O)_2$**
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.

(22) **Structural, magnetic and catalytic properties of cobalt chromite obtained through precursor method**
Gingasu, D., Mindru, 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.

(23) **Hexanuclear 3d-4f neutral $Co^{II}_2Ln^{III}_4$ clusters: Synthesis, structure, and magnetism**
Goura, J., Chakraborty, A., **Walsh, J.**, Tuna, F., Chandrasekhar, V., *Cryst. Growth Des.* **2015**, *15*, 3157–3165.

(24) **P–C bond cleavage-assisted lanthanide phosphate coordination polymers**
Goura, J., **Walsh, J.**, Tuna, F., Halder, R., Maji, T., Chandrasekhar, V., *Cryst. Growth Des.* **2015**, *15*, 2555–2560.

(25) **Discrete and polymeric cobalt organophosphates: Isolation of a 3-D cobalt phosphate framework exhibiting selective CO_2 capture**
Gupta, S. K., Kuppuswamy, S., **Walsh, J. P. S.**, McInnes, E. J. L., Murugavel, R., *Dalton Trans.* **2015**, *44*, 5587–5601.

(26) **A synthetic strategy for switching the single ion anisotropy in tetrahedral Co(II) complexes**
Vaidya, S., Upadhyay, A., Singh, S. K., Gupta, T., Tewary, S., Langley, S. K., **Walsh, J. P. S.**, Murray, K. S., Rajaraman, G., Shanmugam, M., *Chem. Comm.* **2015**, *51*, 3739–3742.

(27) **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., 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*, 12019–12026.

(28) **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*, 13434–13438.

(29) **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.

(30) **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*, 3385–3391.

(31) **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*, 11531–11539.

(32) **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*, 8464–8472.

INVITED TALKS

APS Global Physics Summit 2026 *(Denver, CO)*	Mar. 2026
APS SCCM Biennial Meeting 2025 *(Washington, DC)*	June 2025
Chemistry Department Seminar *(Florida International University, Miami, FL)*	Feb. 2025
Duke-CAMD/MURI/AFLOW Seminar *(Virtual)*	Jan. 2025
24th Annual Sukant Tripathy Symposium *(Lowell, MA, USA)*	Dec. 2024
81st Pittsburgh Diffraction Conference *(Ithaca, NY, USA)*	Sep. 2024
Chemistry Department Seminar *(University of Massachusetts Amherst, MA, USA)*	Sep. 2024
American Chemical Society Fall Meeting *(Denver, CO, USA)*	Aug. 2024
Chemistry Department Seminar *(University of Rochester, NY, USA)*	May 2024
Advanced Photon Source Users Meeting *(Argonne National Laboratory, IL, USA)*	May 2024
Boston Regional Inorganic Colloquium *(University of New Hampshire, NH, USA)*	May 2024
Chemistry Department Seminar *(University at Buffalo, NY, USA)*	Apr. 2024
Chemistry Department Seminar *(The Ohio State University, OH, USA)*	Feb. 2024
Chemistry Department Seminar *(Michigan State University, MI, USA)*	Feb. 2024
Chemistry Department Seminar *(University of Washington, WA, USA)*	Jan. 2024
Physics Department Seminar *(University of Nevada Las Vegas, NV, USA)*	Jan. 2024
NSF Professional Development Workshop in Ceramics *(Northeastern University, MA, USA)*	Nov. 2023
Chemistry Department Seminar *(University of Massachusetts Dartmouth, MA, USA)*	Oct. 2023
ARL-ARO Seminar Series *(Virtual)*	Aug. 2023
AIRAPT Biennial Meeting 2023 *(University of Edinburgh, UK)*	Jul. 2023
Materials Science Division Seminar *(Lawrence Livermore National Laboratory, CA, USA)*	Jul. 2023
APS GSCCM Biennial Meeting 2023 *(Chicago, IL, USA)*	Jul. 2023
Boston Regional Inorganic Colloquium *(Harvard Medical School, MA, USA)*	Dec. 2022
Workshop of the IUCr Commission on High Pressure *(Advanced Photon Source, IL, USA)*	Dec. 2022
Chemistry Department Seminar *(Clemson University, NC, USA)*	Oct. 2022
AEROMAT 2022 *(Pasadena, CA, USA)*	Mar. 2022
Rigaku High Pressure Workshop *(Virtual)*	Jul. 2021

CDAC Webinar *(Virtual)* Mar. 2021
Special Seminar *(Georgia Institute of Technology, GA, USA)* Feb. 2019
Special Seminar *(University of Massachusetts Amherst, MA, USA)* Jan. 2019
Special Seminar *(University of Michigan, MI, USA)* Dec. 2018
Materials in Extreme Environments at ACS Fall 2018 *(Boston, MA, USA)* Aug. 2018
Workshop of the IUCr Commission on High Pressure *(Honolulu, HI, USA)* Jul. 2018
Special Seminar *(Michigan State University, MI, USA)* Jan. 2018
HPCAT Beamline Review *(Advanced Photon Source, IL, USA)* Nov. 2017
Probing Materials Under Extreme Conditions Workshop *(Advanced Photon Source, IL, USA)* Oct. 2017
Nuclear Resonant Scattering Workshop *(Argonne National Laboratory, IL, USA)* Nov. 2016
Research at High Pressure GRS *(Holderness School, NH, USA)* Jul. 2016

TEACHING

CHEM 341: Inorganic Chemistry *(Professor)* F20, F21, F22, F23, F24
CHEM 342: Inorganic Chemistry Lab *(Professor)* S25
CHEM 560: Materials Chemistry *(Professor)* F19, S22, S23
CHEM 743: Crystallography and Solid-State Chemistry *(Professor)* S21

MENTORSHIP

Ph.D. Students (current): Anshu Baiya (exp. 2029), Tracey L. Nelson (exp. 2028), John Arigbede (exp. 2027), Elizabeth E. Cote (exp. 2027).

Ph.D. Students (graduated): Scott D. Ambos (2025), Nicholas S. Manganaro (2024), Paul V. Marshall (2024), Scott D. Thiel (2024), Kimberly A. Pereira (2024; NSF GRFP Honorable Mention; Directed Energy Professional Society Award).

LEADERSHIP AND PROFESSIONAL SERVICE

Editorial Board Member *(Communications Chemistry, Springer Nature)* Dec. 2024 – Present
Councilor *(American Chemical Society Connecticut Valley Section)* Jan. 2026 – Present
Member-At-Large *(American Chemical Society Connecticut Valley Section)* Jan. 2024 – Dec. 2025
High Pressure Review Panel Member *(Advanced Photon Source)* Mar. 2020 – Nov. 2025
Users Organization Steering Committee Member *(Advanced Photon Source)* Jul. 2019 – May 2022

CAMPUS SERVICE

Graduate Admissions Committee *(Department of Chemistry)* 2019 – 2023
Graduate Recruitment Committee *(Department of Chemistry)* 2019 – Present
Departmental Personnel Committee *(Department of Chemistry)* 2023 – Present
Faculty Search Committee *(Department of Chemistry)* 2024 – 2026

PROFESSIONAL ACTIVITIES

Co-Organizer *(ACS Connecticut Valley Section Undergraduate Research Symposium)* 2024
Session Chair *(Northeast Regional Meeting of the American Chemical Society)* 2023