

Conrad Goodwin
unknown
Inorganic Chemistry Group



Overview

The Goodwin Group works in the Department of Chemistry at the University of Manchester to further our understanding of the f-block elements – lanthanides and actinides.

The research focuses on non-aqueous chemistry to realise well-defined coordination geometries with which to stabilise highly reactive and unusual oxidation states and bonding motifs.

Research outputs

Reactions of a uranium(III) complex with N-heterocycles to form diuranium(IV) ketimides

Goodwin, C., Godsall, M., Zhang, S., Du, J., Atkinson, B., Seed, J., Ariciu, A.-M., Wooles, A., Tuna, F., Adams, R., Chilton, N., Liddle, S. & Mills, D., 28 May 2026, (Accepted/In press) In: *Inorganic Chemistry*.

Magnetic Hysteresis at 31 K in a Four-Coordinate Dysprosium(III) Amide Complex

Reant, B., Blackmore, W., Kofod, N., Seed, J., Oakley, M. & Goodwin, C., 28 Jan 2026, In: *Journal of the American Chemical Society*. 148, 3, p. 2942-2953

Transient Triamidoamine Neptunium(V)-Mono(imido) Complexes: C-H Activations and Hydrogen Atom Transfer Driven by Effective Nuclear Charge

Dutkiewicz, M., Douair, I., Du, J., Goodwin, C., Tacconi, L., Perfetti, M., Gaunt, A., Greer, S. M., Stein, B. W., Caciuffo, R., Colineau, E., Griveau, J.-C., Seed, J., Kovács, A. L., Scott, B. L., Wooles, A., Maron, L., Walter, O. & Liddle, S., 2026, In: *Journal of the American Chemical Society*.

Synthesis, Redox Chemistry, and Electronic Structures of *bis*-di(silylamido)silane *f* element Complexes

Reant, B., Duggan, S. G., Seed, J., Miro, P. & Goodwin, C., 3 Nov 2025, In: *Inorganic Chemistry*. 64, 43, p. 21465–21478

Transuranium organometallic chemistry

Réant, B. L. L., Deakin, C. N., MacKenzie, R. E. & Goodwin, C. A. P., 1 Sept 2025, In: *Nature Reviews Chemistry*. 9, 9, p. 578-600 23 p.

Uranium(III) and Uranium(IV) meta-Terphenylthiolate Complexes

Réant, B. L. L., Seed, J. A., Whitehead, G. F. S. & Goodwin, C. A. P., 24 Feb 2025, In: *Inorganic Chemistry*. 64, 7, p. 3161-3177 17 p.

Trigonal planar heteroleptic lanthanide(III) bis(silyl)amide complexes containing aminoxyl radicals and anions

Gransbury, G. K., Nicholas, H., Murphy, S., Emerson-King, J., Vonci, M., Goodwin, C., Winpenny, R., Chilton, N., Giansiracusa, M. & Mills, D. P., 25 Nov 2024, In: *Inorganic Chemistry*. 63, 47, p. 22422–22434

Mechanochemical Synthesis, Characterization and Reactivity of a Room Temperature Stable Calcium Electride

Bowles, A. W. J., Quirk, J. A., Liu, Y., Morritt, G. H., Freitag, M., Whitehead, G. F. S., Woodward, A. W., Brookfield, A., Goodwin, C. A. P., Collison, D., Tuna, F., McMullin, C. L., Dawson, J. A., Lu, E. & Ortu, F., 8 Oct 2024, In: *Journal of the American Chemical Society*. 146, 42, p. 28914-28924

δ -Bonding modulates the electronic structure of formally divalent Nd^{I} rare earth arene complexes

MacKenzie, R. E., Hajdu, T., Seed, J. A., Whitehead, G. F. S., Adams, R. W., Chilton, N. F., Collison, D., McInnes, E. J. L. & Goodwin, C. A. P., 7 Oct 2024, In: *Chemical Science*. 15, 37, p. 15160-15169 10 p.

Rare earth mixed sandwich complexes with tetraalkylphospholide and cyclooctatetraenide ligands

Deakin, C. N., O'Neill, D. J., Adams, R. W., Whitehead, G. F. S. & Goodwin, C. A. P., 15 Sept 2024, In: Journal of Organometallic Chemistry. 1018, 123287.

Ligand-Metal Complementarity in Rare-Earth and Actinide Chemistry

Goodwin, C. A. P. & Corbey, J. F., 27 May 2024, In: Inorganic Chemistry. 63, 21, p. 9355-9362 8 p.

What is a Sandwich Complex?

Goodwin, C. A. P., 27 May 2024, In: Inorganic Chemistry. 63, 21, p. 9363-9365 3 p.

N-Heterocyclic Carbene to Actinide d-Based π -bonding Correlates with Observed Metal-Carbene Bond Length Shortening Versus Lanthanide Congeners

Goodwin, C. A. P., Adams, R. W., Gaunt, A. J., Hanson, S. K., Janicke, M. T., Kaltsoyannis, N., Liddle, S. T., May, I., Miller, J. L., Scott, B. L., Seed, J. A. & Whitehead, G. F. S., 17 Apr 2024, In: Journal of the American Chemical Society. 146, 15, p. 10367-10380 14 p.

What is a Sandwich Complex?

Goodwin, C. A. P., 11 Mar 2024, In: Organometallics. 43, 5, p. 595-597 3 p.

Carbene Complexes of Plutonium: Structure, Bonding, and Divergent Reactivity to Lanthanide Analogs

Murillo, J., Seed, J., Wooles, A., Oakley, M., Goodwin, C., Gregson, M., Dan, D., Chilton, N., Gaunt, A. J., Kozimor, S. A., Liddle, S. & Scott, B. L., 14 Feb 2024, In: Journal of the American Chemical Society. 146, 6, p. 4098-4111 14 p.

What is the nature of the uranium(iii)-arene bond?

Chowdhury, S. R., Goodwin, C. & Vlasisavljevich, B., 14 Dec 2023, In: Chemical Science. 15, 5, p. 1810-1819 10 p.

Stabilization of Pu(IV) in $\text{PuBr}_4(\text{OPCy}_3)_2$ and Comparisons with Structurally Similar $\text{ThX}_4(\text{OPR}_3)_2$ (R = Cy, Ph) Molecules

Windorff, C. J., Goodwin, C. A. P., Sperling, J. M., Albrecht-Schönzart, T. E., Bai, Z., Evans, W. J., Huffmann, Z. K., Jeannin, R., Long, B. N., Mills, D. P., Poe, T. N. & Ziller, J. W., 24 Oct 2023, In: Inorganic Chemistry .

Synthesis and comparison of iso-structural f-block metal complexes (Ce, U, Np, Pu) featuring η^6 -arene interactions

Murillo, J., Goodwin, C. A. P., Stevens, L., Fortier, S., Gaunt, A. J. & Scott, B. L., 20 Jun 2023, In: Chemical Science. 14, 27, p. 7438-7446 9 p.

Isostructural σ -hydrocarbyl phospholide complexes of uranium, neptunium, and plutonium

Černá, M., Seed, J. A., Garrido Fernandez, S., Janicke, M. T., Scott, B. L., Whitehead, G. F. S., Gaunt, A. J. & Goodwin, C. A. P., 28 Oct 2022, In: Chemical Communications. 58, 95, p. 13278-13281 4 p.

Carbene Complexes of Neptunium

Goodwin, C., Wooles, A., Murillo, J., Lu, E., Boronski, J., Scott, B. L., Gaunt, A. J. & Liddle, S., 24 May 2022, In: American Chemical Society. Journal . 144, 22, p. 9764-9774

Synthesis of heteroleptic yttrium and dysprosium 1,2,4-tris(trimethylsilyl)cyclopentadienyl complexes

Corner, S., Goodwin, C., Ortu, F., Evans, P., Zhang, H., Gransbury, G., Whitehead, G. & Mills, D., 4 Apr 2022, In: Australian Journal of Chemistry.

A Terminal Neptunium(V)-Mono(Oxo) Complex

Dutkiewicz, M., Goodwin, C., Perfetti, M., Gaunt, A. J., Griveau, J.-C., Colineau, E., Kovács, A. L., Wooles, A., Caciuffo, R., Walter, O. & Liddle, S., 1 Mar 2022, In: Nature Chemistry. 14, 3, p. 342-349 8 p.

2.2.2-Cryptand complexes of neptunium(iii) and plutonium(iii)

Goodwin, C. A. P., Ciccone, S. R., Bekoe, S., Majumdar, S., Scott, B. L., Ziller, J. W., Gaunt, A. J., Furche, F. & Evans, W. J., 20 Jan 2022, In: Chemical Communications. 58, 7, p. 997-1000 4 p.

[An]3(THF)4 (An = Np, Pu) Preparation Bypassing An0 Metal Precursors: Access to Np3+/Pu3+ Nonaqueous and Organometallic Complexes

Goodwin, C., Janicke, M. T., Scott, B. L. & Gaunt, A., 15 Dec 2021, In: Journal of the American Chemical Society. 143, 49, p. 20680-20696 17 p.

Isolation and characterization of a californium metallocene

Goodwin, C. A. P., Su, J., Stevens, L. M., White, F. D., Anderson, N. H., Auxier, J. D., Albrecht-Schönzart, T. E., Batista, E. R., Briscoe, S. F., Cross, J. N., Evans, W. J., Gaiser, A. N., Gaunt, A. J., James, M. R., Janicke, M. T., Jenkins, T. F., Jones, Z. R., Kozimor, S. A., Scott, B. L. & Sperling, J. M. & 4 others, Wedal, J. C., Windorff, C. J., Yang, P. & Ziller, J. W., 18 Nov 2021, In: Nature. 599, p. 421-424 4 p., 7885.

Complexation and Redox Chemistry of Neptunium, Plutonium and Americium with a Hydroxylamino Ligand

Su, J., Cheisson, T., McSkimming, A., Goodwin, C. A. P., DiMucci, I., Albrecht-Schoenzart, T., Scott, B., Batista, E. R., Gaunt, A., Kozimor, S. A., Yang, P. & Schelter, E. J., 20 Oct 2021, In: Chemical Science. 12, 40, p. 13343-13359

Synthesis, characterization, and theoretical analysis of a plutonyl phosphine oxide complex

Windorff, C. J., Beltran-Leiva, M. J., Albrecht-Schönzart, T. E., Bai, Z., Celis-Barros, C., Goodwin, C. A. P., Huffman, Z., McKinnon, N. C. & Sperling, J. M., 1 Oct 2021, In: Dalton Transactions. 50, 41, p. 14537-14541 5 p.

Structural and Spectroscopic Comparison of Soft-Se vs. Hard-O Donor Bonding in Trivalent Americium/Neodymium Molecules

Goodwin, C. A. P., Schlimgen, A. W., Albrecht-Schönzart, T. E., Batista, E. R., Gaunt, A. J., Janicke, M. T., Kozimor, S. A., Scott, B. L., Stevens, L. M., White, F. D. & Yang, P., 12 Apr 2021, In: Angewandte Chemie - International Edition. 60, 17, p. 9459-9466 8 p.

Expanding the Nonaqueous Chemistry of Neptunium: Synthesis and Structural Characterization of [Np(NR₂)₃Cl], [Np(NR₂)₃Cl]⁻, and [Np{N(R)(SiMe₂CH₂)₂(NR₂)₂}₂(NR₂)]⁻ (R = SiMe₃)

Staub, S. L., Stevens, L. M., Smiles, D. E., Goodwin, C. A. P., Billow, B. S., Scott, B. L., Wu, G., Tondreau, A. M., Gaunt, A. J. & Hayton, T. W., 15 Feb 2021, In: Inorganic Chemistry. 60, 4, p. 2740-2748 9 p.

Low-spin 1,1'-diphospha-metallo-cenates of chromium and iron

Greer, S. M., Üngör, Ö., Beattie, R. J., Kiplinger, J. L., Scott, B. L., Stein, B. W. & Goodwin, C. A. P., 16 Jan 2021, In: Chemical Communications. 57, 5, p. 595-598 4 p.

Isolation and electronic structures of derivatized manganocene, ferrocene and cobaltocene anions

Goodwin, C., Giansiracusa, M., Greer, S., Nicholas, H., Evans, P., Vonci, M., Hill, S., Chilton, N. & Mills, D., 14 Dec 2020, In: Nature Chemistry. 13, 3, p. 243-248 6 p., 0.

Blocking like it's hot: A synthetic chemists' path to high-temperature lanthanide single molecule magnets

Goodwin, C. A. P., 7 Nov 2020, In: Dalton Transactions. 49, 41, p. 14320-14337 18 p.

A Single Small-Scale Plutonium Redox Reaction System Yields Three Crystallographically-Characterizable Organoplutonium Complexes

Windorff, C. J., Sperling, J. M., Albrecht-Schönzart, T. E., Bai, Z., Evans, W. J., Gaiser, A. N., Gaunt, A. J., Goodwin, C. A. P., Hobart, D. E., Huffman, Z. K., Huh, D. N., Klamm, B. E. & Poe, T. N., 21 Sept 2020, In: Inorganic Chemistry. 59, 18, p. 13301-13314 14 p.

Strangely attractive: Collaboration and feedback in the field of molecular magnetism

Goodwin, C. A. P., Ortu, F. & Reta, D., 15 Jul 2020, In: International Journal of Quantum Chemistry. 120, 14, p. 1-8 8 p., e26248.

Heteroleptic Samarium(III) Chalcogenide Complexes: Opportunities for Giant Exchange Coupling in Bridging σ - and π -Radical Lanthanide Dichalcogenides

Goodwin, C., Reant, B., Vettese, G. F., Kragoskow, J., Giansiracusa, M., DiMucci, I. M., Lancaster, K. M., Mills, D. & Sproules, S., 1 Jun 2020, In: Inorganic Chemistry. 59, 11, p. 7571-7583

Understanding magnetic relaxation in single-ion magnets with high blocking temperature

Chiesa, A., Cugini, F., Hussain, R., Macaluso, E., Allodi, G., Garlatti, E., Giansiracusa, M., Goodwin, C., Ortu, F., Reta, D., Skelton, J., Guidi, T., Santini, P., Solzi, M., De Renzi, R., Mills, D., Chilton, N. & Carretta, S., 4 May 2020, In: Physical Review B. 101, 17, 174402.

A double-dysprosocenium single-molecule magnet bound together with neutral ligands

Evans, P., Reta, D., Goodwin, C. A. P., Ortu, F., Chilton, N. F. & Mills, D. P., 16 Apr 2020, (E-pub ahead of print) In: Chemical Communications.

In-Plane Thorium(IV), Uranium(IV), and Neptunium(IV) Expanded Porphyrin Complexes

Brewster, J. T., Mangel, D. N., Gaunt, A. J., Saunders, D. P., Zafar, H., Lynch, V. M., Boreen, M. A., Garner, M. E., Goodwin, C. A. P., Settineri, N. S., Arnold, J. & Sessler, J. L., 6 Nov 2019, In: Journal of the American Chemical Society. 141, 44, p. 17867-17874 8 p.

[Am(C₅Me₄H)₃]: An Organometallic Americium Complex

Goodwin, C. A. P., Su, J., Albrecht-Schmitt, T. E., Blake, A. V., Batista, E. R., Daly, S. R., Dehnen, S., Evans, W. J., Gaunt, A. J., Kozimor, S. A., Lichtenberger, N., Scott, B. L. & Yang, P., 19 Aug 2019, In: Angewandte Chemie - International Edition. 58, 34, p. 11695-11699 5 p.

Light Lanthanide Metalloccenium Cations Exhibiting Weak Equatorial Anion Interactions

Liu, J., Reta, D., Cleghorn, J. A., Yeoh, Y. X., Ortu, F., Goodwin, C., Chilton, N. & Mills, D., 7 Jun 2019, In: Chemistry: A European Journal. 25, 32, p. 7749-7758 10 p.

Electronic Structures of Bent Lanthanide(III) Complexes with Two N-Donor Ligands

Nicholas, H., Vonci, M., Goodwin, C. A. P., Loo, S. W., Murphy, S., Cassim, D., Winpenny, R. E. P., McInnes, E. J. L., Chilton, N. F. & Mills, D. P., 2019, In: Chemical Science.

Engineering electronic structure to prolong relaxation times in molecular qubits by minimising orbital angular momentum

Ariciu, A.-M., Woen, D. H., Huh, D. N., Nodaraki, L., Kostopoulos, A., Goodwin, C., Chilton, N., McInnes, E., Winpenny, R., Evans, W. J. & Tuna, F., 2019, In: Nature Communications. 10, 3330.

Studies of Hysteresis and Quantum Tunnelling of the Magnetisation in Dysprosium(III) Single Molecule Magnets

Ortu, F., Reta, D., Ding, Y.-S., Goodwin, C. A. P., Gregson, M., McInnes, E. J. L., Winpenny, R. E. P., Zheng, Y.-Z., Liddle, S., Mills, D. P. & Chilton, N. F., 2019, In: Dalton Transactions.

Salt metathesis routes to homoleptic near-linear Mg(II) and Ca(II) bulky bis(silyl)amide complexes

Leng, J.-D., Goodwin, C., Vitorica-Yrezabal, I. & Mills, D., 28 Sept 2018, In: Dalton Transactions. 47, 36, p. 12526-12533 8 p.

Terbocenium: completing a heavy lanthanide metalloccenium cation family with an alternative anion abstraction strategy

Goodwin, C., Reta, D., Ortu, F., Liu, J., Chilton, N. & Mills, D., 25 Aug 2018, In: Chemical Communications. 54, 66, p. 9182-9185 4 p.

Heteroleptic Samarium(III) Halide Complexes Probed by Fluorescence-Detected L₃-Edge X-ray Absorption Spectroscopy

Goodwin, C., Reant, B., Kragoskow, J. G. C., DiMucci, I. M., Lancaster, K. M., Mills, D. & Sproules, S., 21 Aug 2018, In: Dalton Transactions. 47, 31, p. 10613-10625 13 p.

Structural Characterization of Lithium and Sodium Bulky Bis(silyl)amide Complexes

Nicholas, H., Goodwin, C., Kragoskow, J. G. C., Lockyer, S. & Mills, D., May 2018, In: Molecules. 23, 5

Exploring Synthetic Routes to Heteroleptic U^{III}, U^{IV} and Th^{IV} Bulky Bis(silyl)amide Complexes

Goodwin, C., Tuna, F., McInnes, E. & Mills, D., 2018, In: European Journal of Inorganic Chemistry. 20-21

Molecular magnetic hysteresis at 60 K in dysprosocenium

Goodwin, C., Ortu, F., Reta, D., Chilton, N. & Mills, D., 24 Aug 2017, In: *Nature*. 548, p. 439-442

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)

Goodwin, C., Chilton, N., Natrajan, L., Boulon, M.-E., Ziller, J. W., Evans, W. J. & Mills, D., 1 May 2017, In: *Inorganic Chemistry*.

Silylamides: towards a half-century of stabilising remarkable f-element chemistry

Goodwin, C. & Mills, D., 2017, *Organometallic Chemistry*. Royal Society of Chemistry, Vol. 41.

Synthesis and Electronic Structures of Heavy Lanthanide Metallocenium Cations

Goodwin, C., Reta, D., Ortu, F., Chilton, N. & Mills, D., 2017, In: *American Chemical Society. Journal* .

Physicochemical Properties of Near-Linear Lanthanide(II) Bis(silylamide) Complexes (Ln = Sm, Eu, Tm, Yb)

Goodwin, C. A. P., Chilton, N. F., Vettese, G. F., Moreno Pineda, E., Crowe, I. F., Ziller, J. W., Winpenny, R. E. P., Evans, W. J. & Mills, D. P., 17 Oct 2016, In: *Inorganic Chemistry*. 55, 20, p. 10057–10067 11 p.

Salt metathesis versus protonolysis routes for the synthesis of silylamide Hauser base (R₂NMgX; X = halogen) and amido-Grignard (R₂NMgR) complexes

Goodwin, C. A. P., Smith, A., Ortu, F., Vitorica-Yrezabal, I. J. & Mills, D. P., 5 Aug 2015, In: *Dalton Transactions*.

Homoleptic Trigonal Planar Lanthanide Complexes Stabilized by Superbulky Silylamide Ligands

Goodwin, C. A. P., Joslin, K. C., Lockyer, S. J., Formanuik, A., Morris, G. A., Ortu, F., Vitorica-Yrezabal, I. J. & Mills, D. P., 2015, In: *Organometallics*. 34, 11, p. 2314-2325 12 p.

The First Near-Linear Bis(Amide) f-block Complex: A Blueprint for a High Temperature Single Molecule Magnet

Chilton, N. F., Goodwin, C. A. P., Mills, D. P. & Winpenny, R. E. P., 5 Nov 2014, In: *Chemical Communications*. 51, p. 101-103 3 p.

[U(III)(N(SiMe₂tBu)₂)₃]: A Structurally Authenticated Trigonal Planar Actinide Complex

Goodwin, C. A. P., Tuna, F., McInnes, E. J. L., Liddle, S. T., McMaster, J., Vitorica-Yrezabal, I. J. & Mills, D., 2014, In: *Chemistry: A European Journal*. 20, 45, p. 14579-14583 4 p.

Prizes

Royal Society University Research Fellowship

Goodwin, C. (Recipient), 2021

Dalton Emerging Researcher Award

Goodwin, C. (Recipient), 2018

J. Robert Oppenheimer Distinguished Postdoctoral Fellowship

Goodwin, C. (Recipient), 2018

EPSRC Doctoral Prize Fellowship

Goodwin, C. (Recipient), 2017