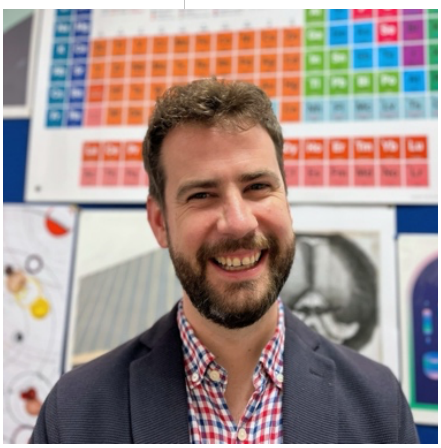
～講演会のご案内～



演 題: **“Designing quantum function using coordination framework magnets”**

講 師: **Dr. Matthew J. Cliffe**
School of Chemistry, University of Nottingham, UK.

日 時: **2025 年 5 月 26 日（月）13：00 ~ 14:30**

場 所: 北海道大学理学部 本館 N−308 室

要 旨: Molecular magnets have proven themselves versatile materials for realising quantum magnetic function due to their chemical tunability. Metal-organic magnets equally offer unique opportunities for control over collective magnetic states, as chemical functionalisation not only allows for tuning of the local magnetic Hamiltonian, but also the creating targeted spatial arrangements and connectivities of individual spins in three dimensions. In this talk I will discuss our work focussing on how this approach can be used to realise magnetic phases challenging to realise in classical dense inorganic materials. I will highlight, in particular, our recent experimental work on the family of layered metal organic magnets $MCl_2(L)$ comprising metal halide chains connected by a molecular ligand. By controlling the metal and ligand we can not only control the local anisotropies and exchange but also the relative axes of these moments. This platform thus allows us to realise a range of different properties, from routes towards the Haldane *S*=2 quantum chain to controllable non-collinear ferromagnetism. I will discuss how neutron scattering can be a powerful tool for metal-organic magnets, providing direct measurement of both the ground states, from Bragg scattering, and excited states (and hence interactions), from modelling of magnetic diffuse scattering and powder inelastic scattering. In addition to exploring how geometry and interactions can be controlled in metal-organic magnets, I will also describe our recent work demonstrating that the control over topology realisable in metal-organic frameworks offers opportunities to produce new spin liquid phases. I show in particular that there are high symmetry topologies that host not previously uncovered classical spin liquids using Monte Carlo simulation, and highlight realistic target MOFs.

Keywords: metal–organic frameworks, quantum materials, magnetism

共 催: 北海道大学大学院総合化学院，フロンティア化学教育研究センター，北海道大学物質科学フロンティアを開拓する Ambitious リーダープログラム，北海道大学スマート物質科学を拓くアンビシャスプログラム

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