Science & Technology Facilities Council
Rutherford Appleton Laboratory

LGBT STEM

@AJPrincep

UNIVERSITY OF OXFORD

Metal-organic coordination polymers as a platform for realising exotic quantum Hamiltonians

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Current “sexy” topics

Spin Liquids

Geometric Frustration

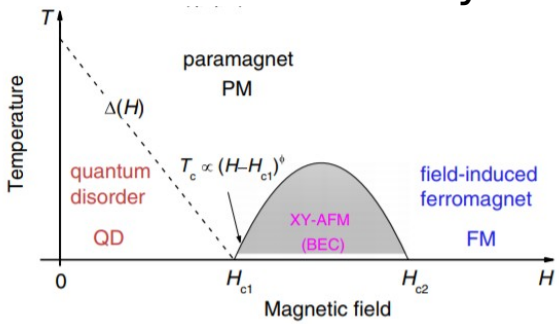
Kitaev model

Quantum models with strong spin-orbit coupling (i.e. 4d and 5d elements)

Anything “Topologically non trivial”

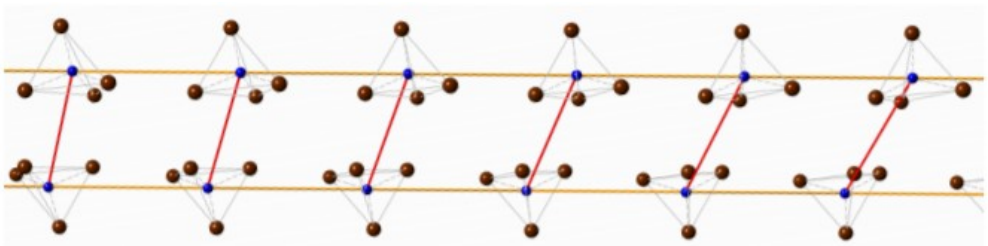
Realisations of interesting Hamiltonians

1D alternating chain (experimental accessibility of the condensate regime)

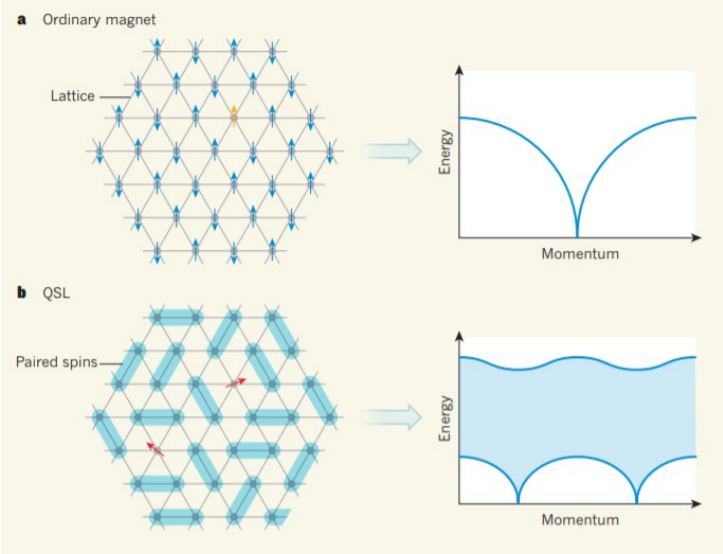


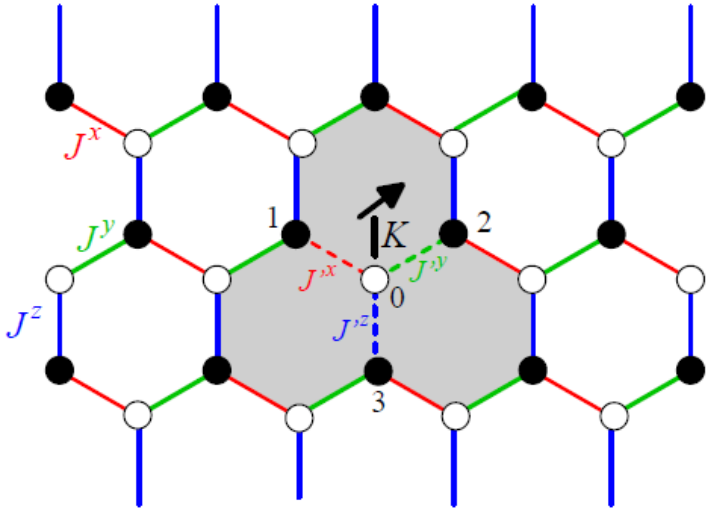
1D spin 3/2 chain (experimental proof of Haldane conjecture)

Almost anything to do with spin ladders



Spin Liquids:





Outstanding issues: ideal systems, supressed contaminating interactions

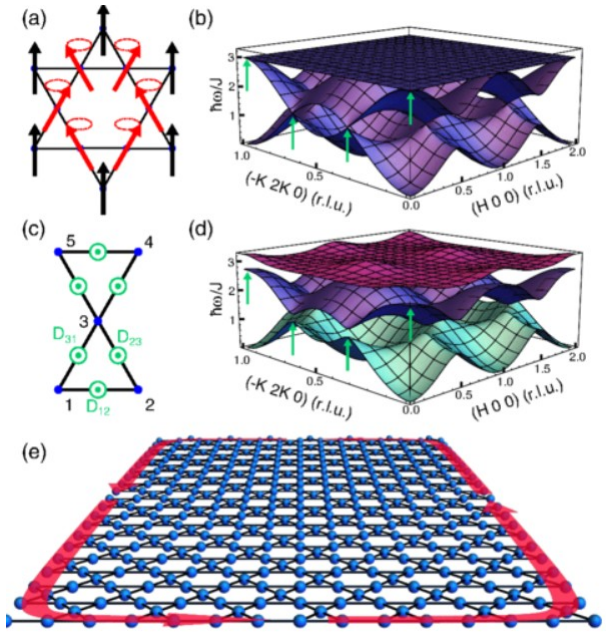
Topological Wizardry

Dirac electrons

Topological magnons

Topological spinons

Vortex / BKT dynamics



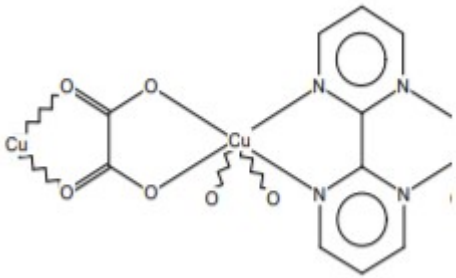
Major Challenges

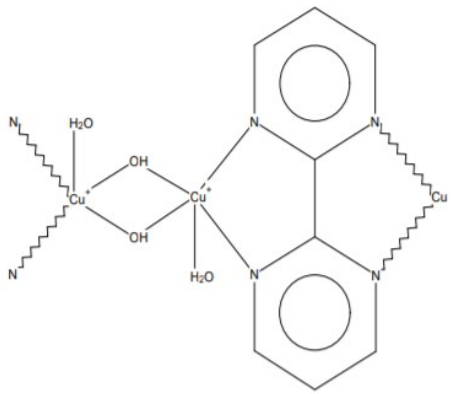
Synthesis is, as always, a huge challenge.

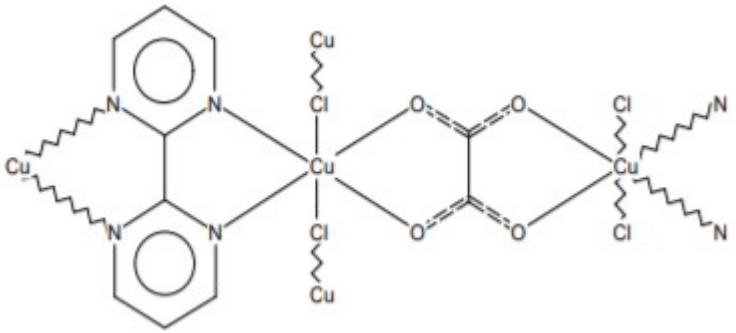
Deuteration, crystal size (magnetic dilution)

Guiding synthesis with accurate predictions would help tremendously

Some current ideas







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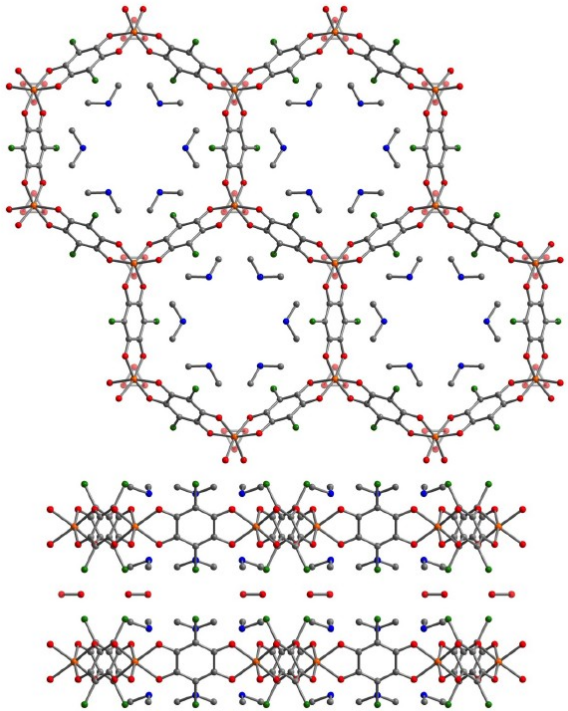
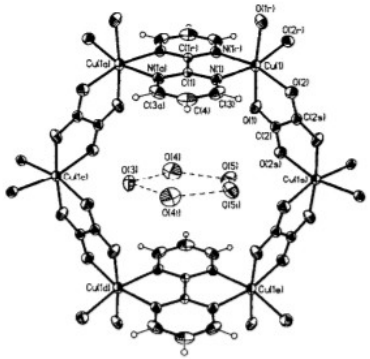
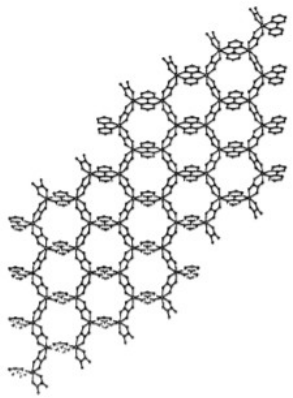
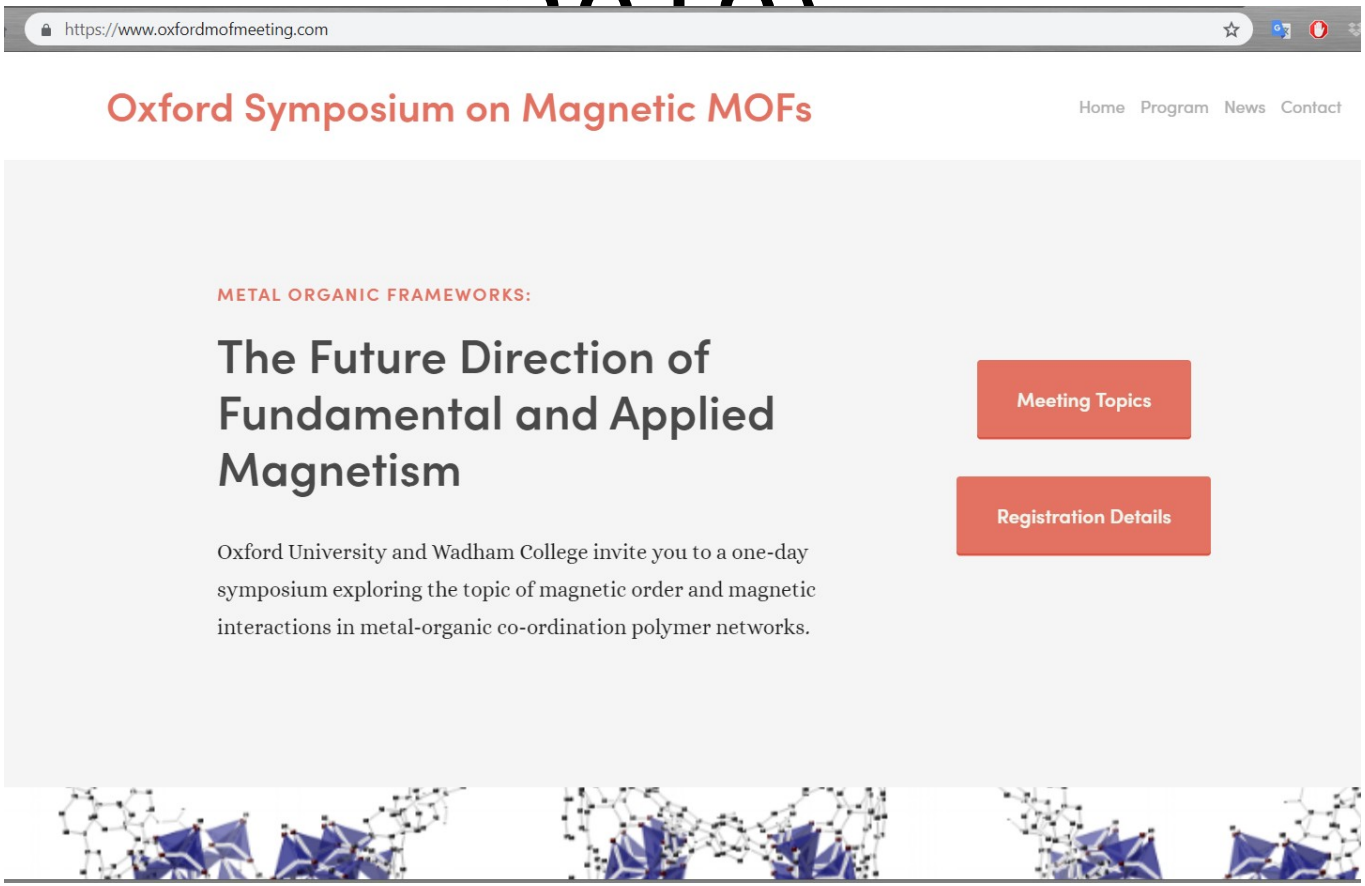






You are invited (March 18, 2019)



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Thanks and Acknowledgements

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