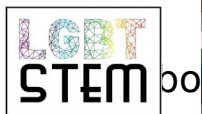




Science & Technology Facilities Council  
Rutherford Appleton Laboratory



@AJPrincep

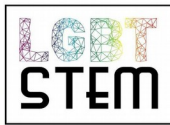


# Metal-organic coordination polymers as a platform for realising exotic quantum Hamiltonians

Andrew Princep (@AJPrincep)  
Wadham College Oxford & Rutherford Appleton Laboratory.

November 2018





# Current “sexy” topics

Spin Liquids

Geometric Frustration

Kitaev model

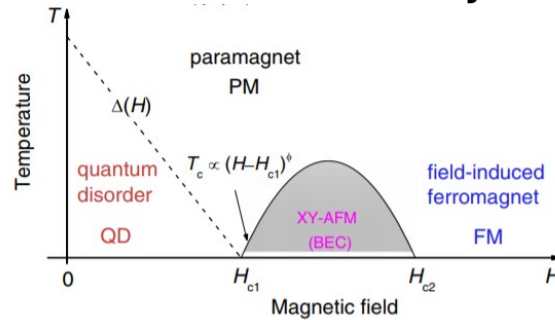
Quantum models with strong spin-orbit coupling (i.e. 4d and 5d elements)

Anything “Topologically non trivial”



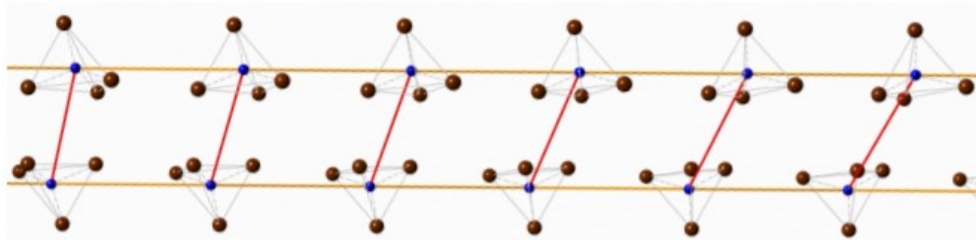
# Realisations of interesting Hamiltonians

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



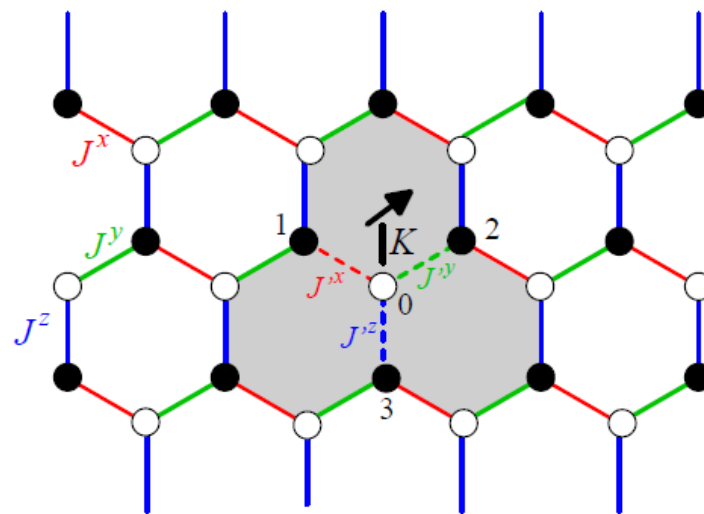
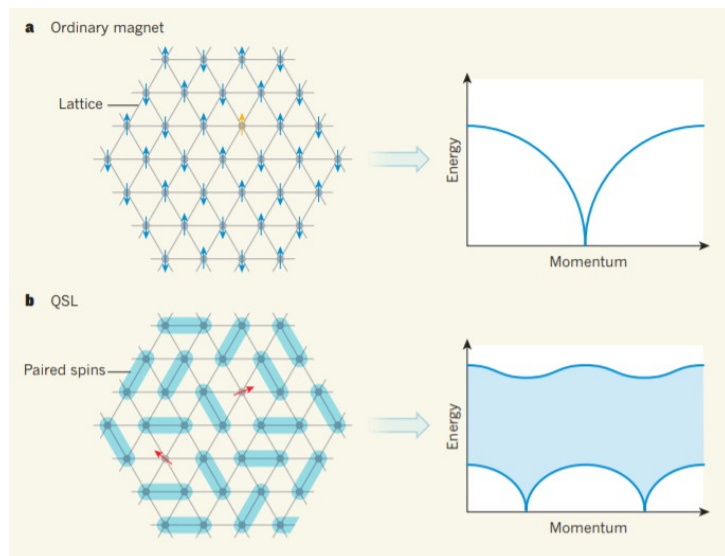
1D spin 3/2 chain (experimental proof of Haldane conjecture)

Almost anything to do with spin ladders





# Spin Liquids:



Outstanding issues: ideal systems, suppressed contaminating interactions



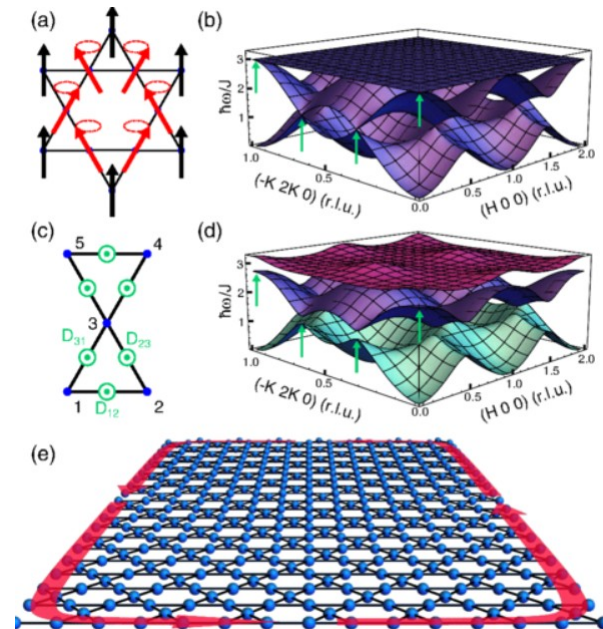
# Topological Wizardry

Dirac electrons

Topological magnons

Topological spinons

Vortex / BKT dynamics





# Major Challenges

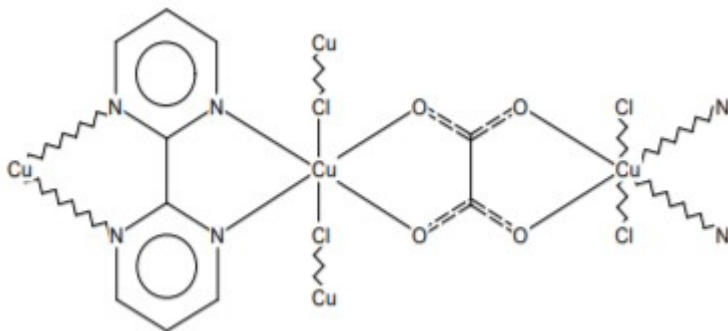
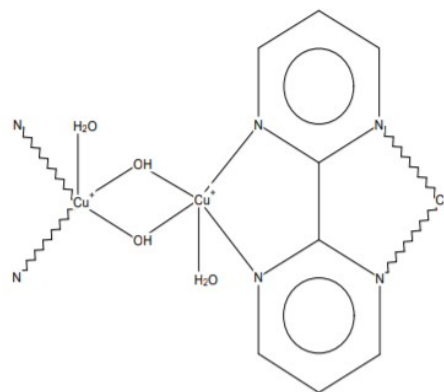
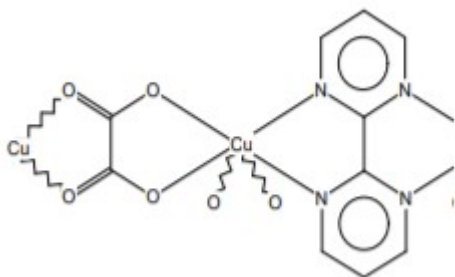
Synthesis is, as always, a huge challenge.

Deuteration, crystal size (magnetic dilution)

Guiding synthesis with accurate predictions would help tremendously

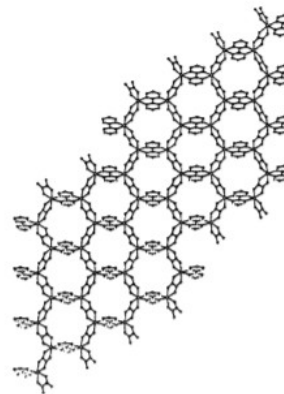
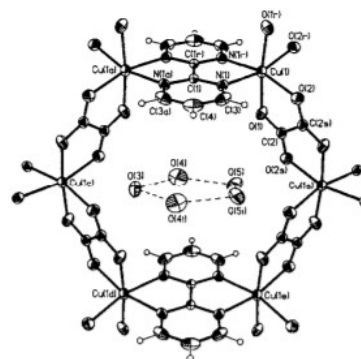
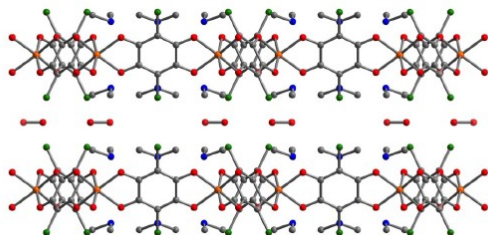
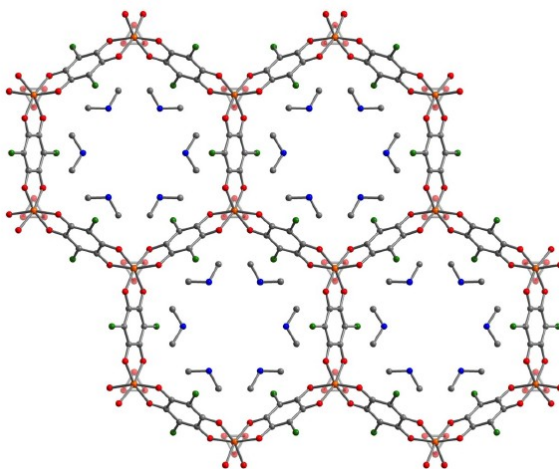


# Some current ideas

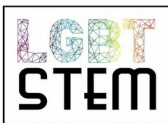




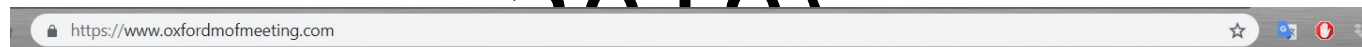
# Cont...







# You are invited (March 18, 2019)



## Oxford Symposium on Magnetic MOFs

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METAL ORGANIC FRAMEWORKS:

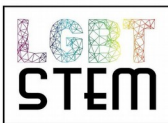
### The Future Direction of Fundamental and Applied Magnetism

Oxford University and Wadham College invite you to a one-day symposium exploring the topic of magnetic order and magnetic interactions in metal-organic co-ordination polymer networks.

[Meeting Topics](#)

[Registration Details](#)





# Thanks and Acknowledgements

