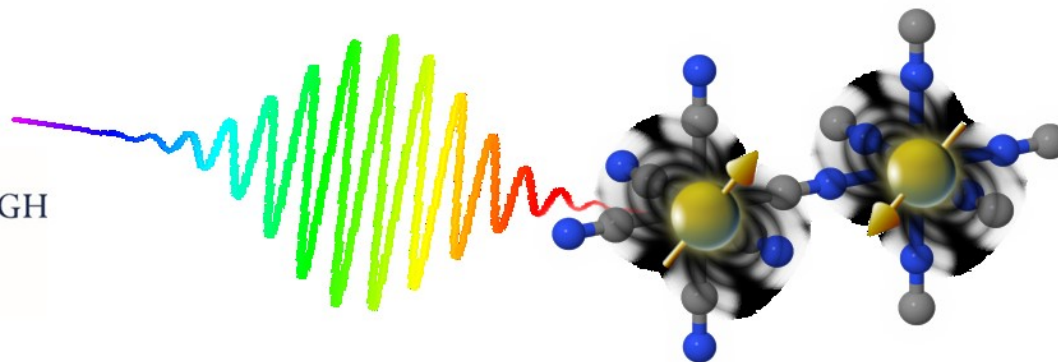


# Femtosecond Spin Dynamics in Molecular Magnets

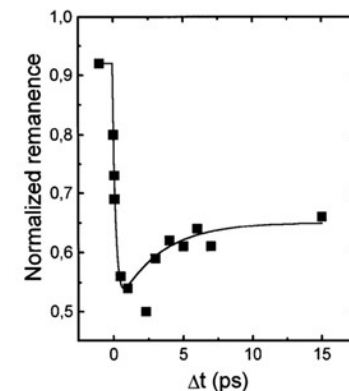
Olof Johansson



THE UNIVERSITY of EDINBURGH  
School of Chemistry



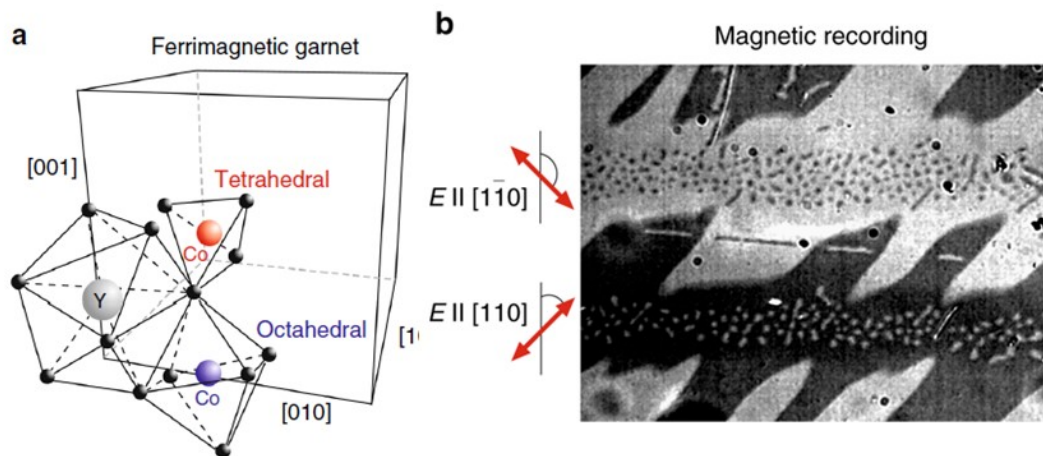
Ultrafast demagnetisation of ferromagnetic thin nickel films in 100 fs



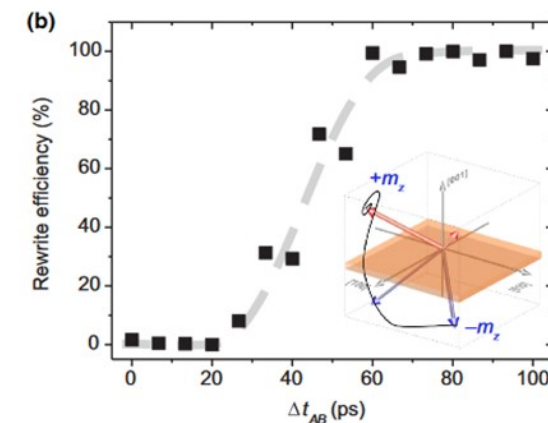
E. Beaurepaire, J.-C. Merle, A. Daunois, and J.-Y. Bigot  
Phys. Rev. Lett. 76, 4250 (1996)



Magnetisation reversal in metal oxides  
Co-doped yttrium iron garnet (YIG:Co)



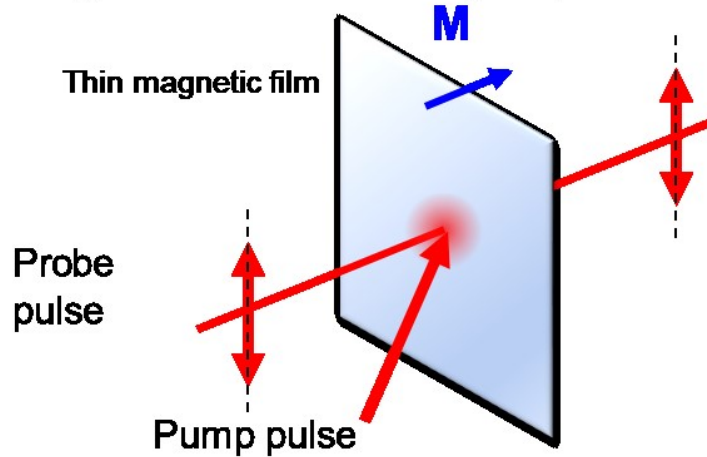
Stupakiewicz et al., Nature, 542, 71 (2017)  
Stupakiewicz et al., Nature Comm., 10, 612 (2019)  
Szerenos et al. Phys. Rev. Appl. 12, 044057 (2019)



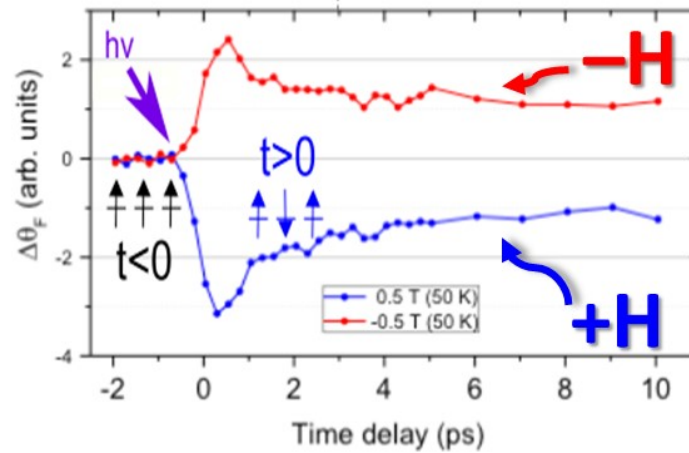
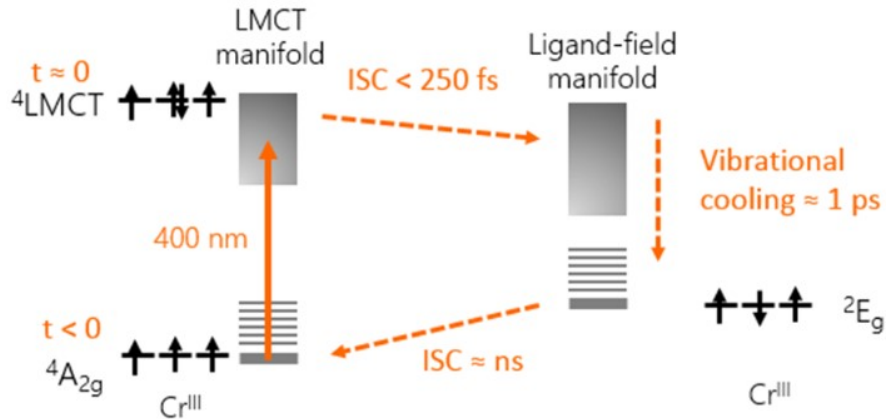
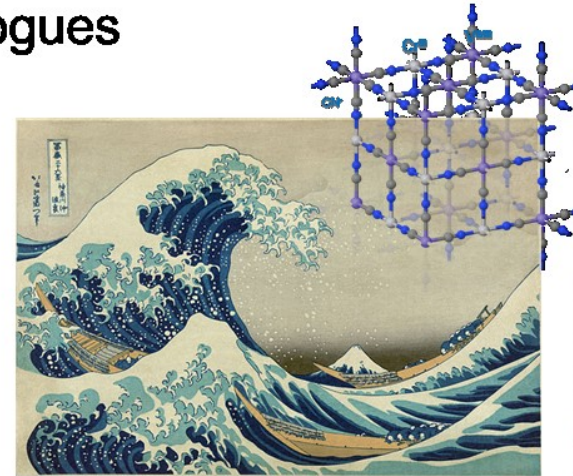
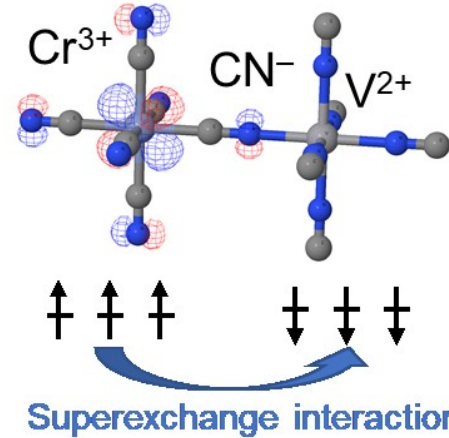
# Spin dynamics in magnetic coordination polymers

## Femtosecond magneto-optics:

Time-resolved magnetic circular dichroism (MCD) / MOKE



## Prussian blue analogues



## Fe<sup>II</sup>-Cr<sup>III</sup> PBA

MMCT @ 450 nm

Ferromagnet

$T_c = 20$  K



## Cr<sup>II</sup>-Cr<sup>III</sup> PBA

MMCT @ 350 nm

Ferrimagnet

$T_c = 240$  K



J. O. Johansson, J.-W. Kim, E. Allwright, D. M. Rogers, N. Robertson, and J.-Y. Bigot

"Directly probing spin dynamics in a molecular magnet with femtosecond time-resolution", Chem. Sci. 7, 7061–7067 (2016)

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