ALBA-ICMAB workshop

Characterization of ordered bulk/film magnetic materials for RT applications using Boreas

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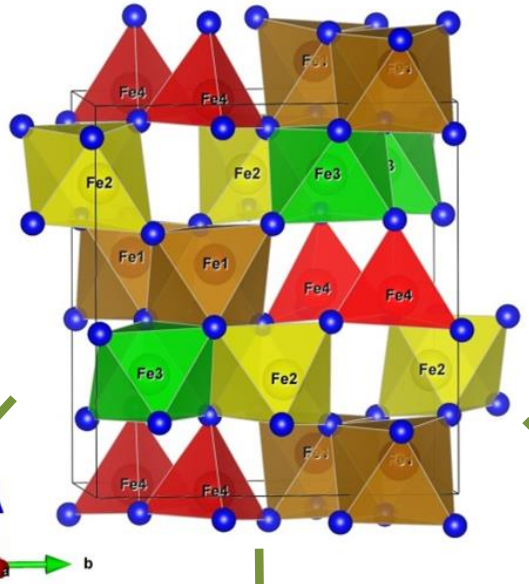
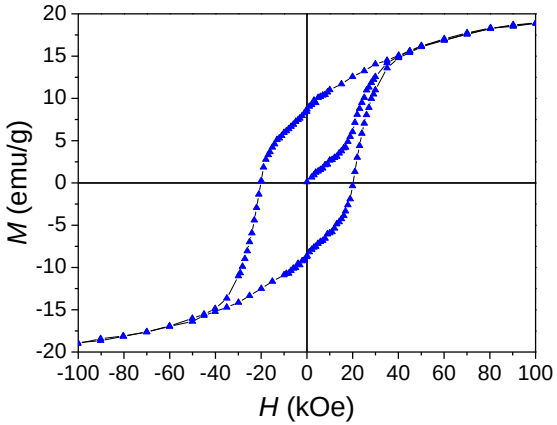
ICMAB: M. Zheng, A. Romaguera, F. Sánchez

TM oxides with large magnetic anisotropy

ε-Fe_2O_3





High density magnetic memories

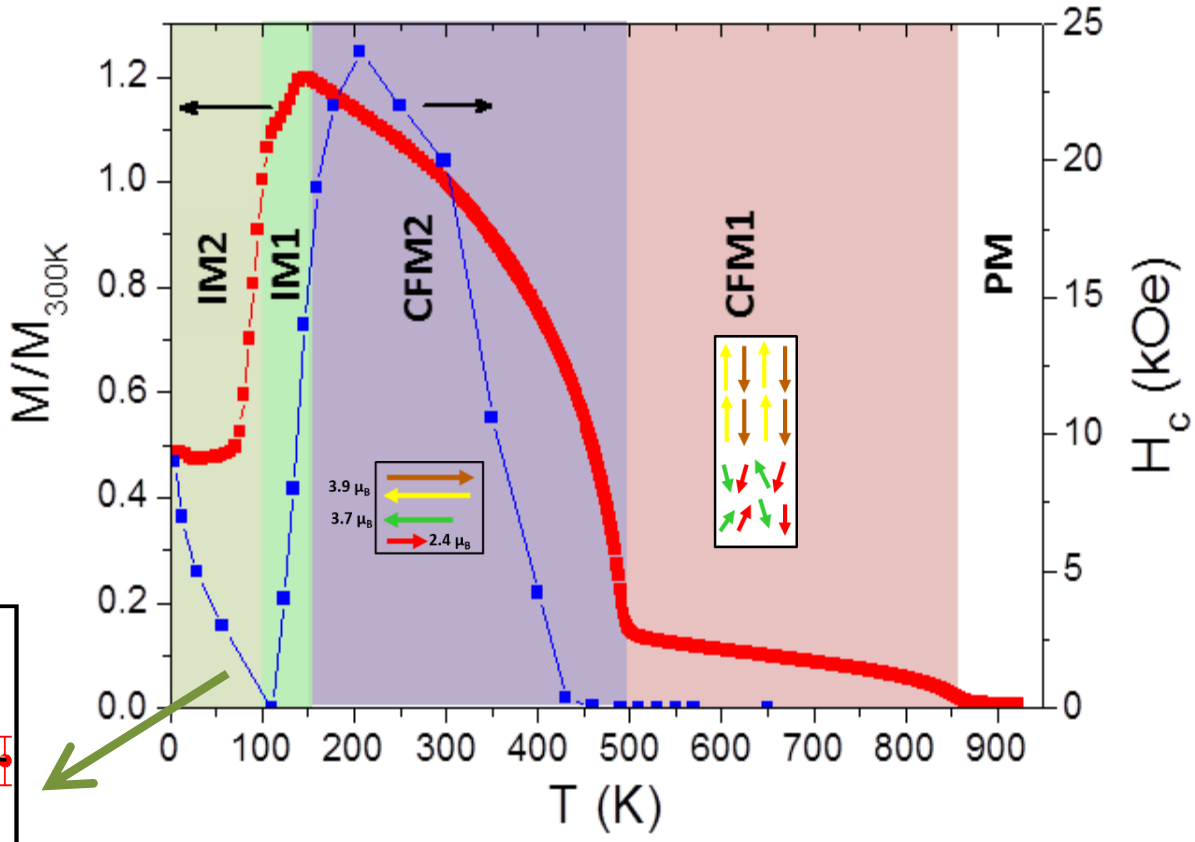
mm-wave magnetic resonances

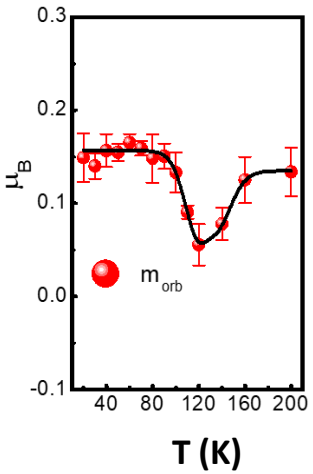
Exchange coupled permanent magnets

erc
European Research Council
Established by the European Commission

FeMiT
(2019-2024)

Orbital & spin magnetic moments vs T

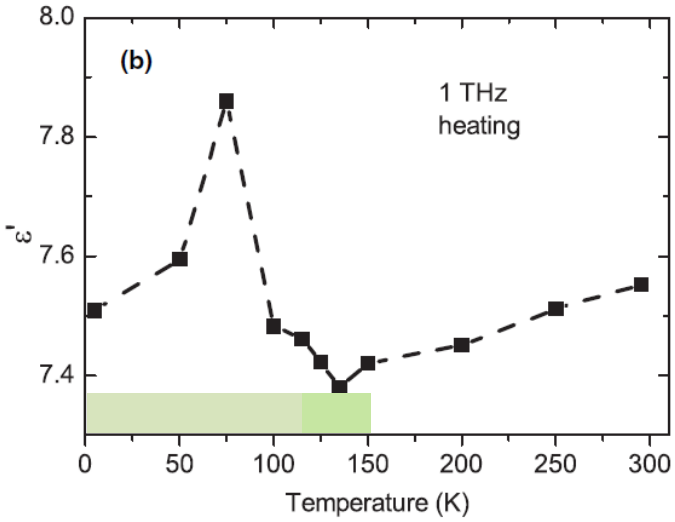


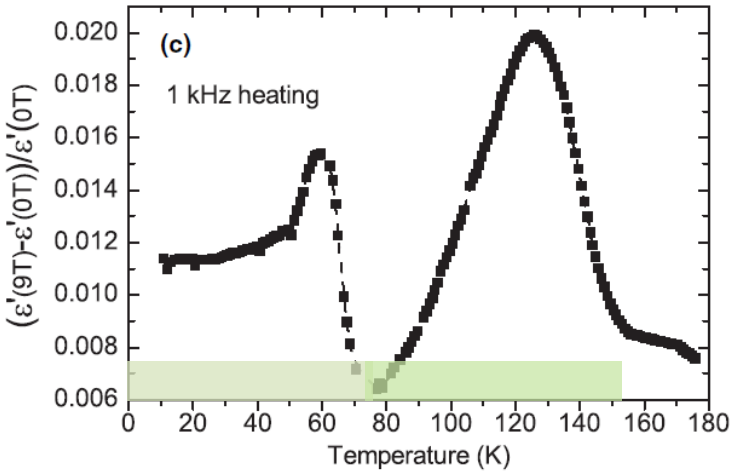


BOREAS

Y. C. Tseng et al., Physical Review B **79** (2009) 094404

Magnetoelectric effects in ICM phases

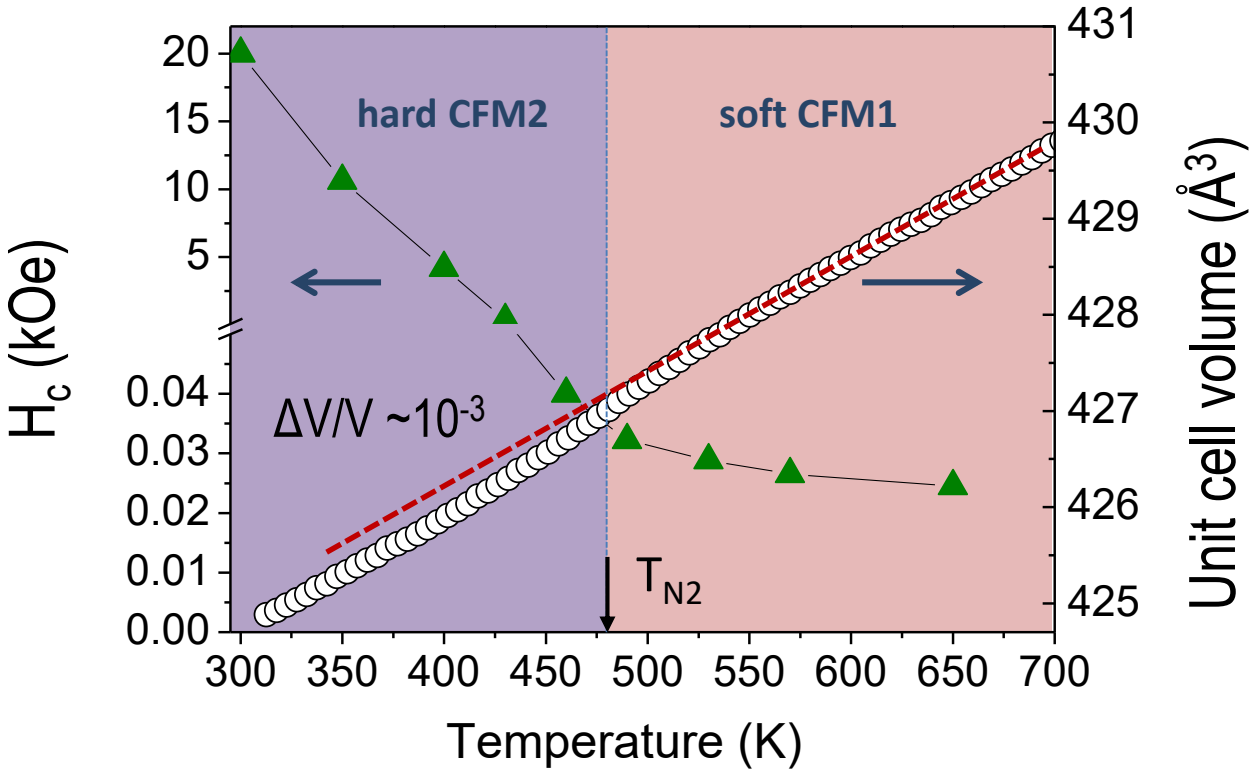




ALBA BOREAS

Ch. Kadlec et al., Physical Review B **88** (2013) 104301

Structural changes vs T, p

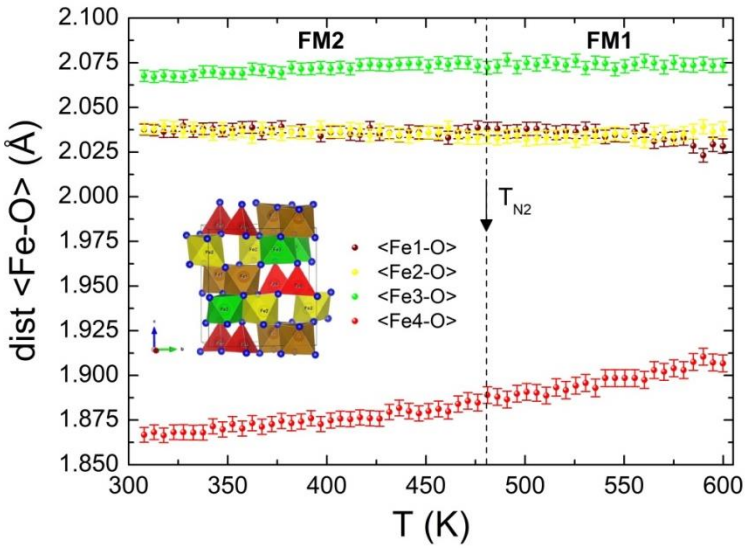


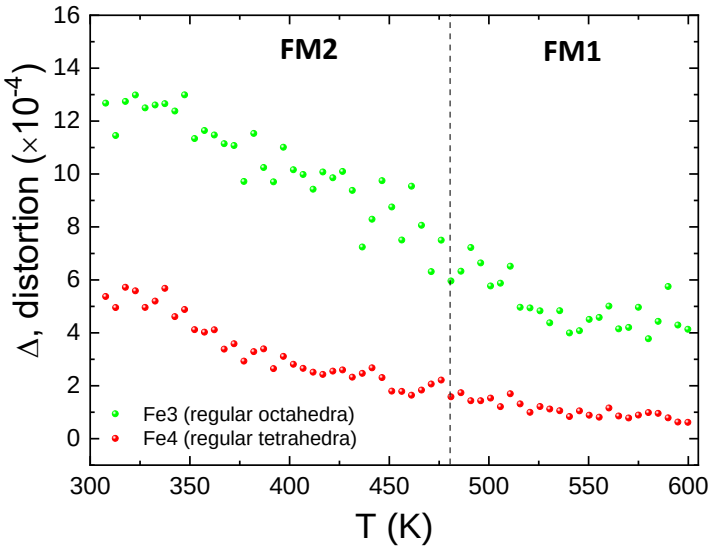
J.L. Garcia-Muñoz et al. *Chem. Mater.* **29** (2017) 9705-9713

J.A. Sans et al. *Nature Comm.* **9** (2018) 4554

ALBA MSPD

Structural changes vs T





- 3 % change of <Fe4-O> bond length
- Increased distortions of Fe3 and Fe4 regular environments

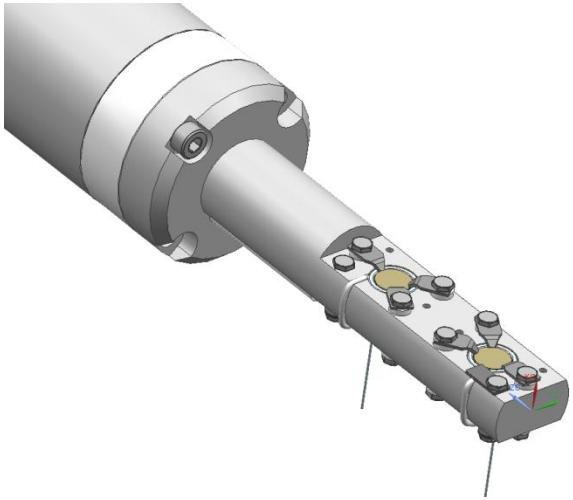
ALBA MSPD

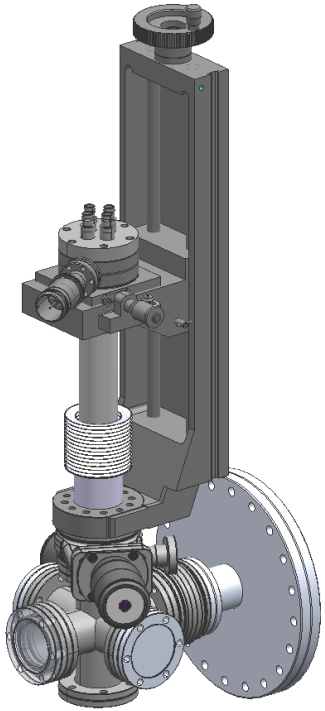
Ongoing development

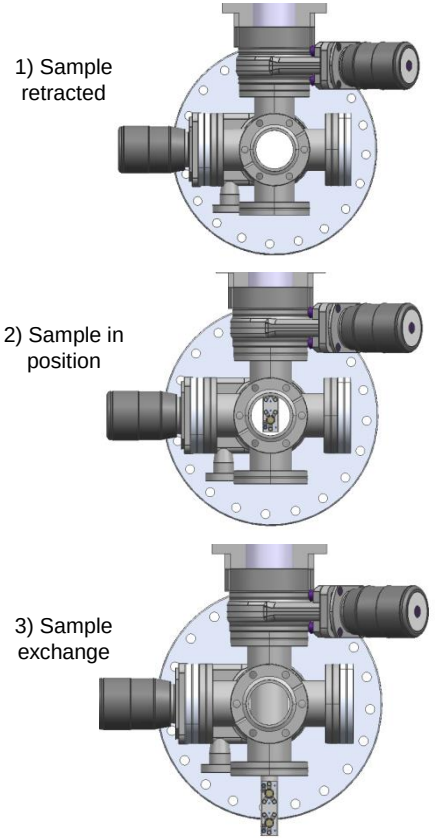
Portable HIgh TEmperature and Magnetic field setup for BOREAS (PHITEM)

J. Herrero Martín , S. Agrestini

1) XAS at high T





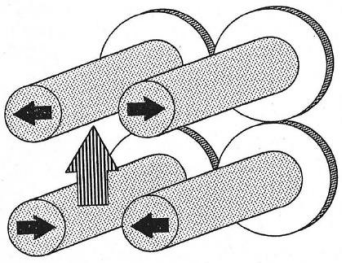


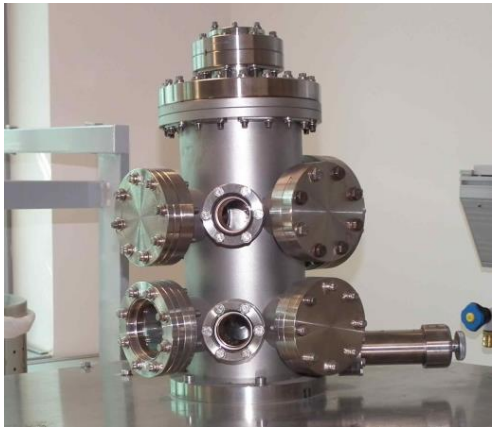
Designs by A. Carballedo

Ongoing development

Portable HIgh TEmperature and Magnetic field setup for BOREAS (PHITEM)

2) XMCD at high T





Future developments

→ Providing MaRes with diffracted polarization analysis for improved RMXS resolution

→ Magnetoelectric studies in MaRes applying voltages (interest for ME effect in ICM phases)