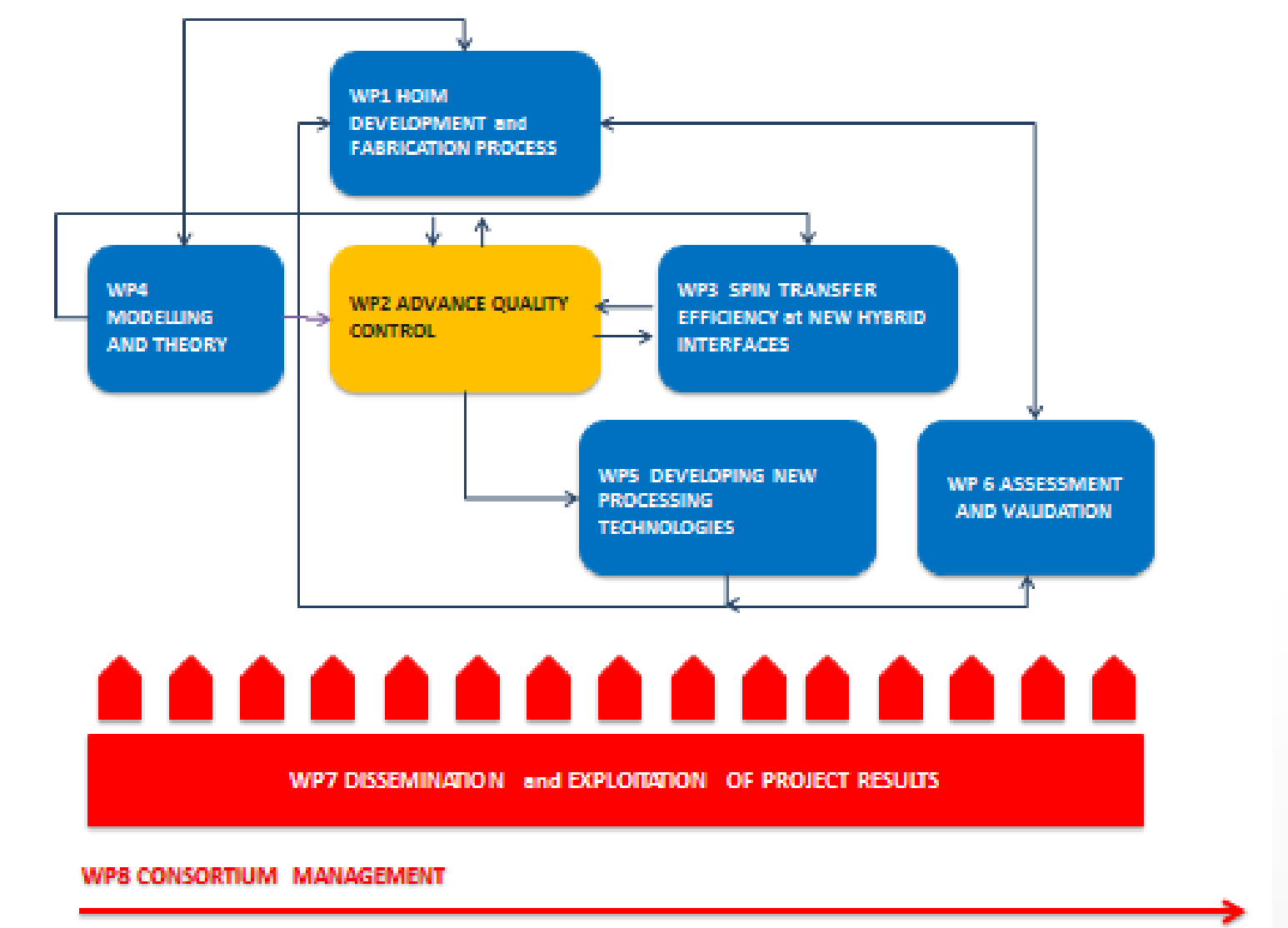




WP2: Advanced quality control

Wp leader: Linköping University

- WP2 provides a large set of techniques for the characterization of the structure, surface morphology, magnetic quality and basic electronic features of the individual components and interfaces of HOI materials fabricated in WP1 *HOI materials development and fabrication*.
- WP2 provides feedback for WP1, provides a starting point for activities in WP3 *Spin transfer efficiency at new hybrid interfaces*, and supports the activities in WP5 *Developing new processing technologies*.



Linköping University
(XMCD/NEXAFS)



University of Valencia
(Materials synthesis)



Nanogune
(SQUID, sample preparation)



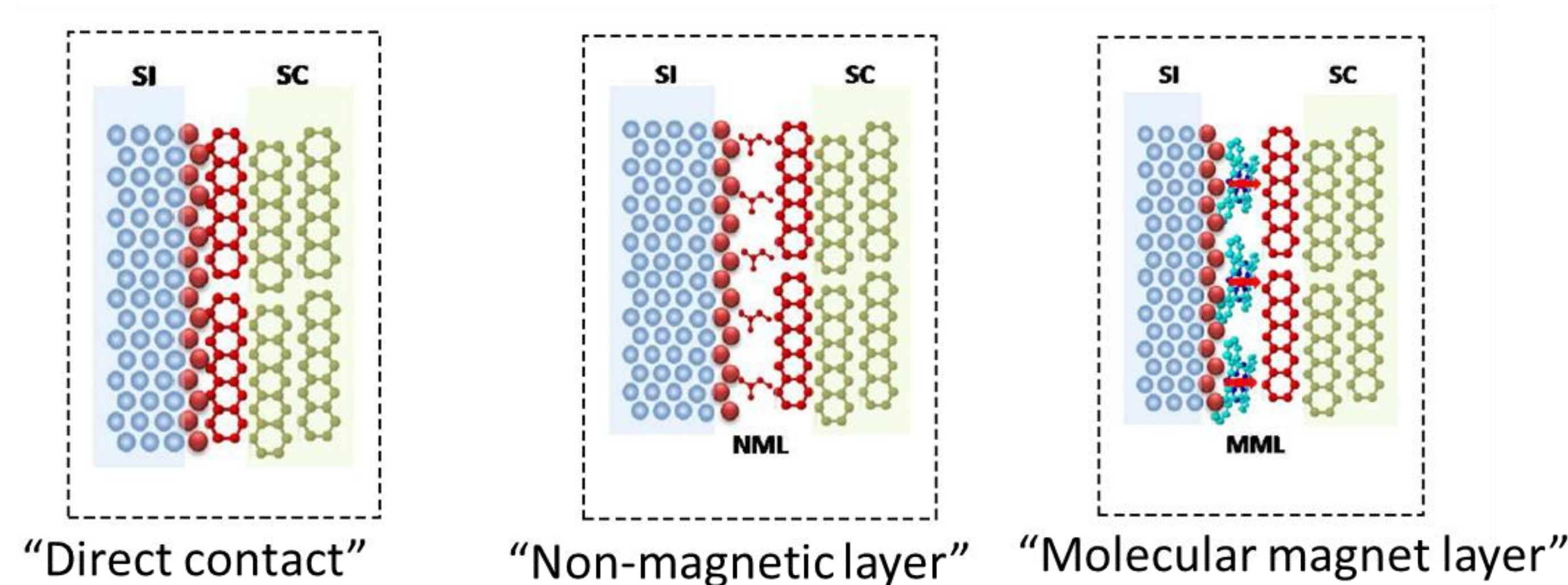
University of Kaiserslautern
(XPS/UPS)



Trinity College Dublin
(Theory development)

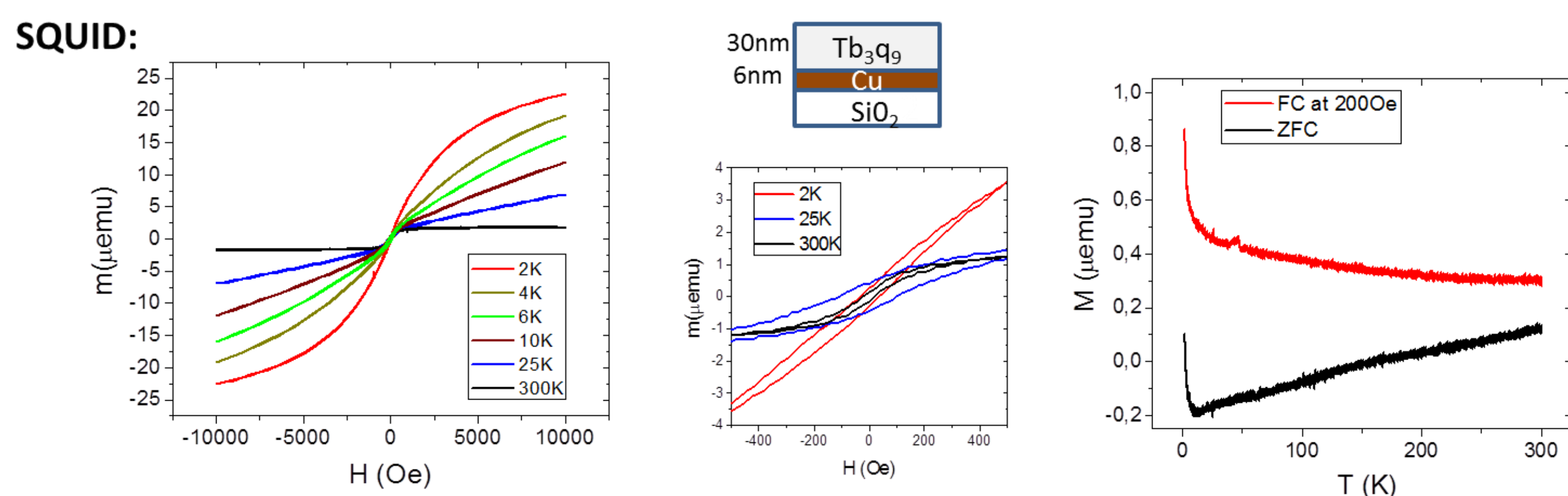
Objectives and Achievements

WP2 has characterized the magnetic and transport properties as well as energy level alignment, hybridized interface states and induced spin-polarization of hybrid organic orbitals of HOI systems including all three spinterface-types pursued as design options in the project (see below).



Molecular magnet layer HOI

Tb₃Q₉/Cu films



“Surface” characterization:

Thick films (~bulk):

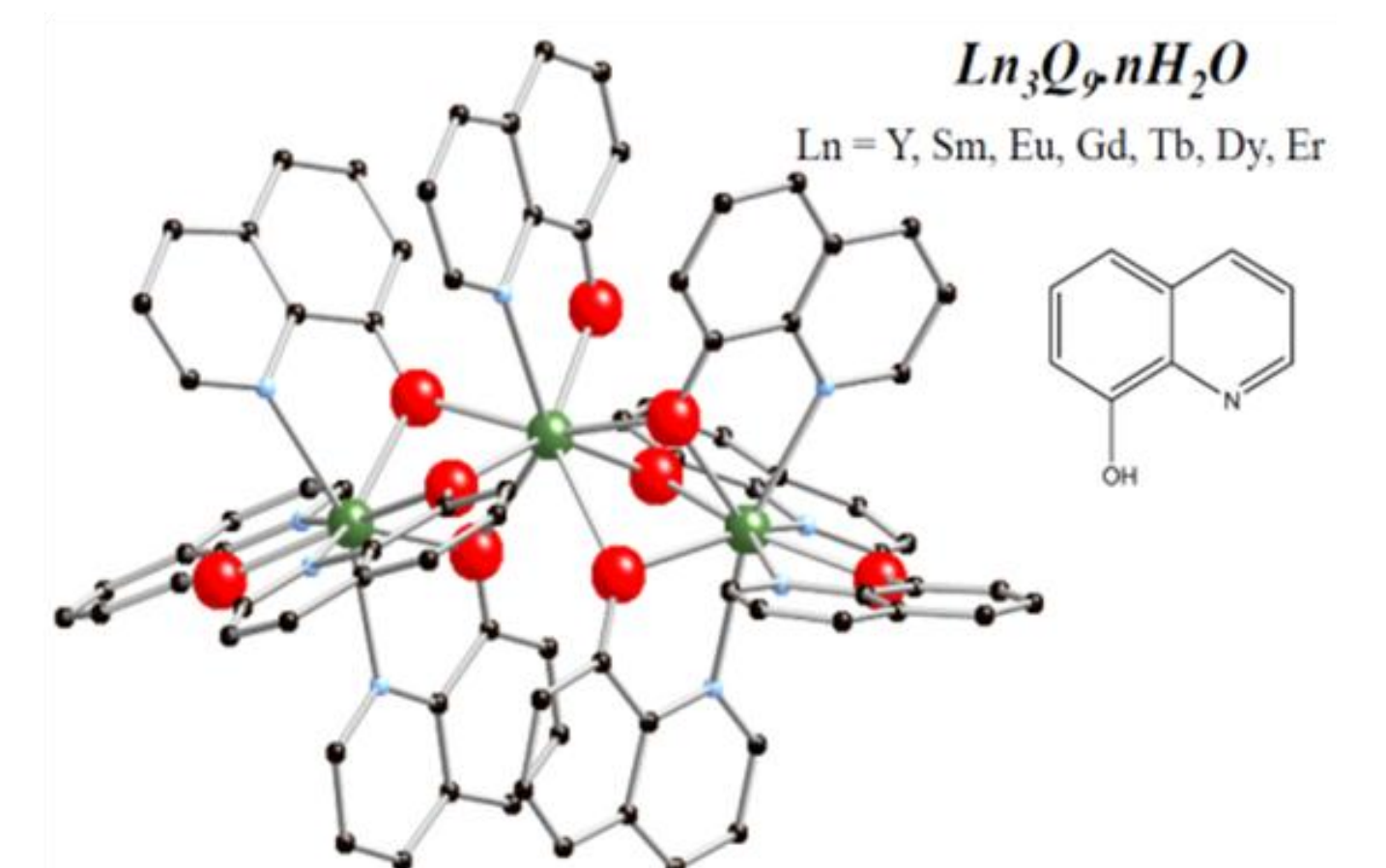
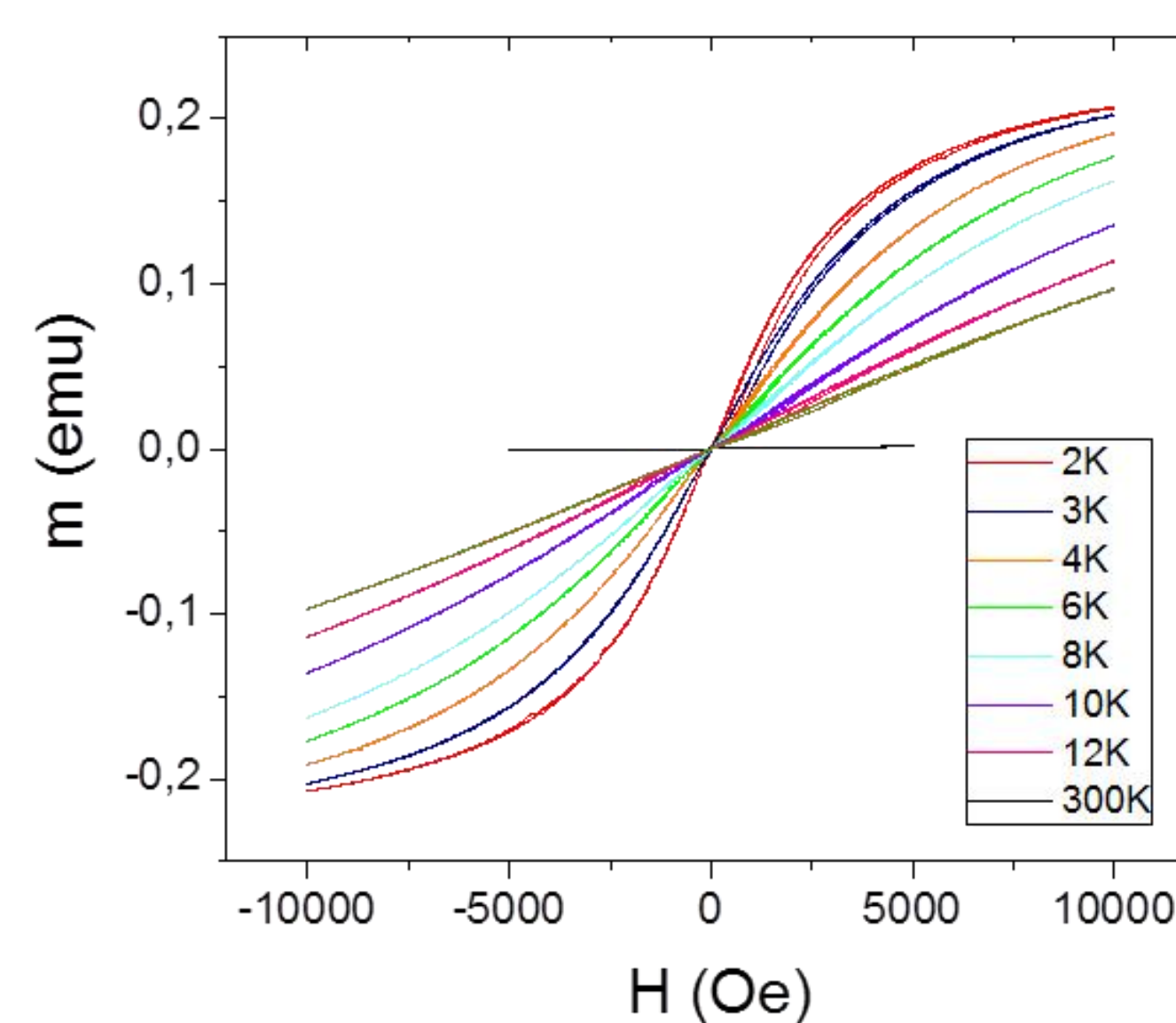
- No XMCD signal at Tb M-edge → paramagnetic behavior (as per SQUID)
- No ligand loss, expected Tb₃Q₉ features (XPS, NEXAFS)

Thin films (~interface):

- Clear XMCD signal at the Cu L-edge and Tb M-edge (T=300K)!
- Strong interaction/ hybridization between Cu and quinoline part of molecule + loss of one ligand (XPS, NEXAFS)

Magnetic properties: Tb₃Q₉ powder

SQUID: Field- and temperature dependence of the magnetization



→ Superparamagnetic, no hysteresis, no blocking behaviour

- Tb₃Q₉ does not have a single-molecule magnet (SMM) behaviour