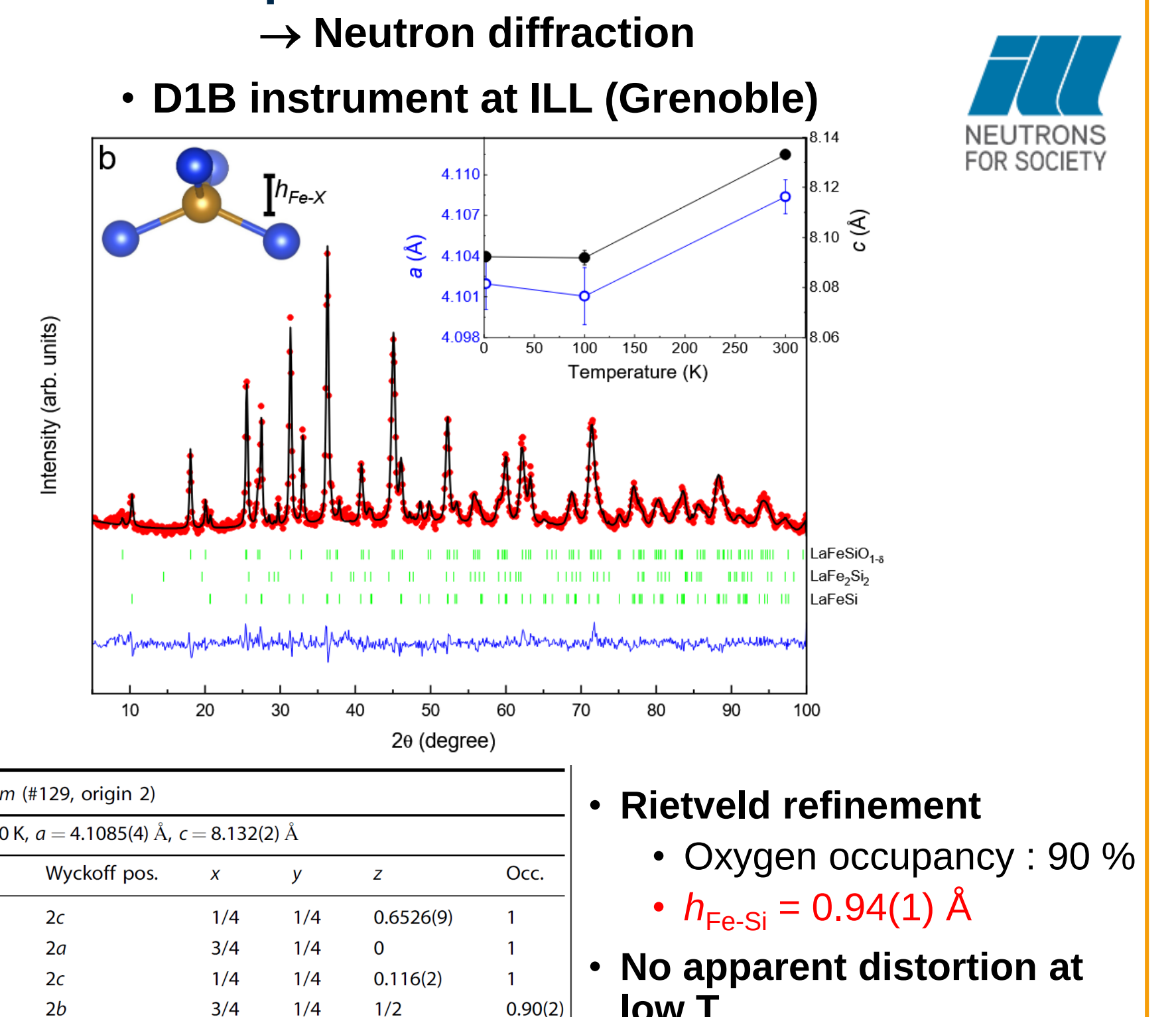
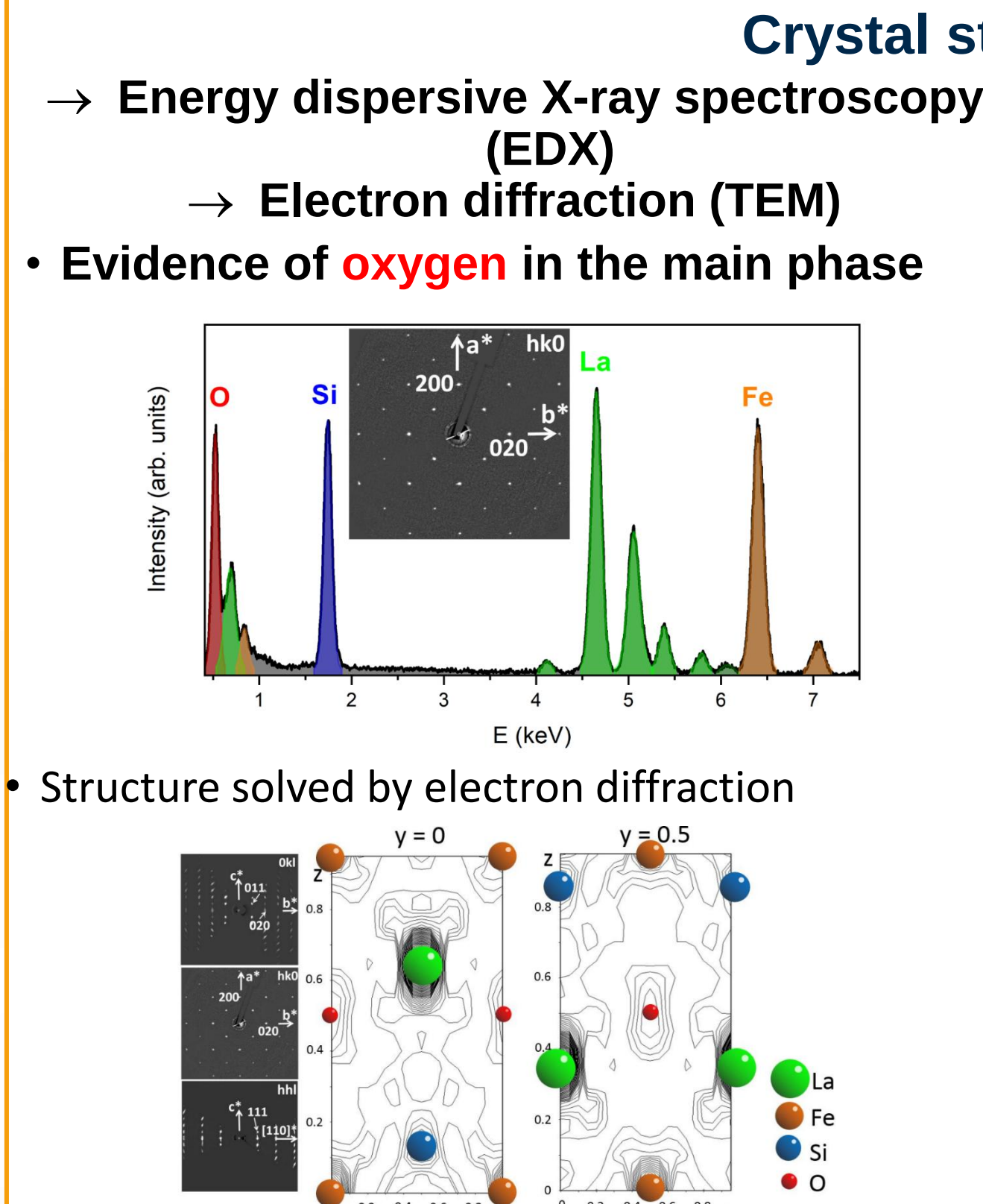
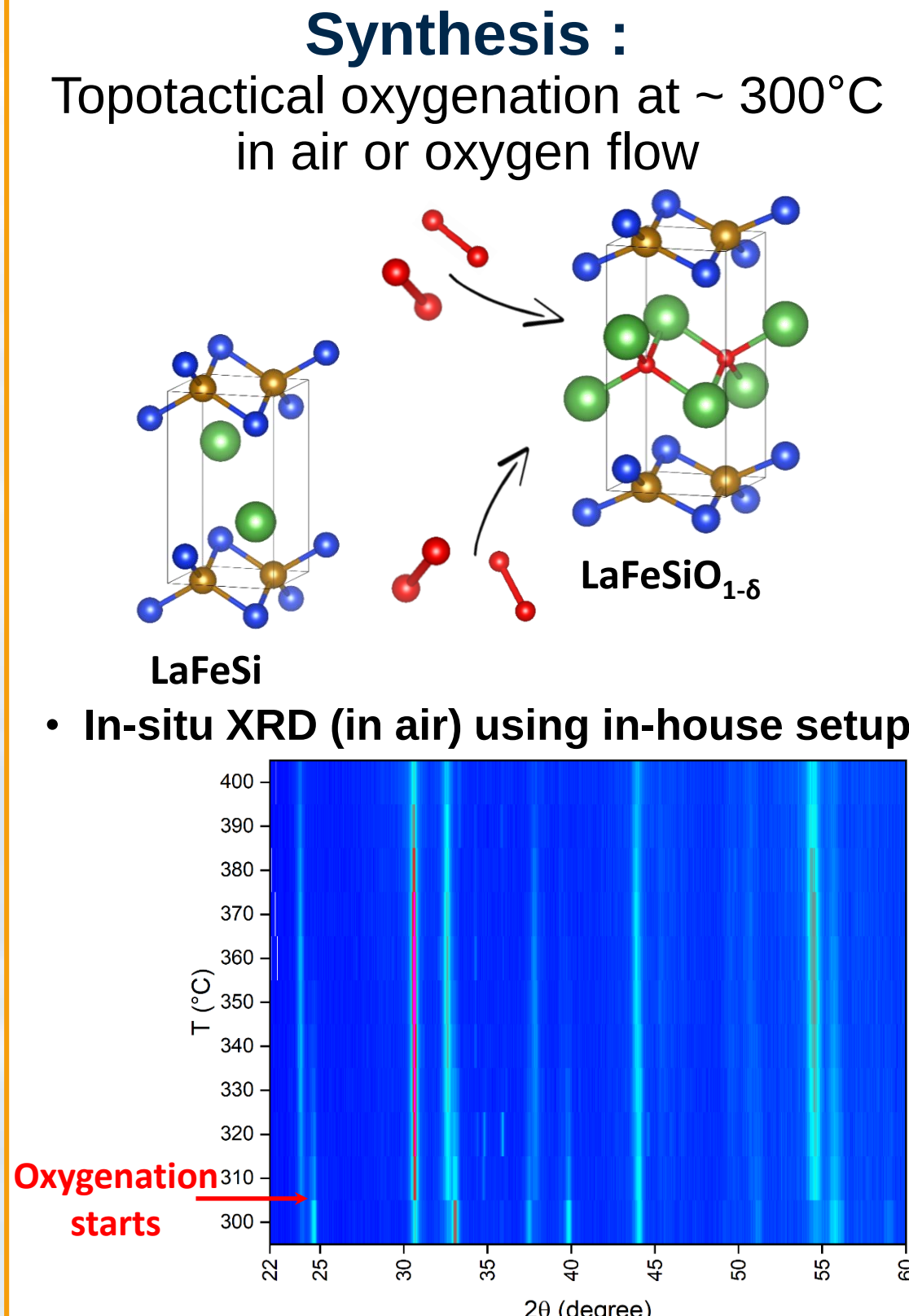


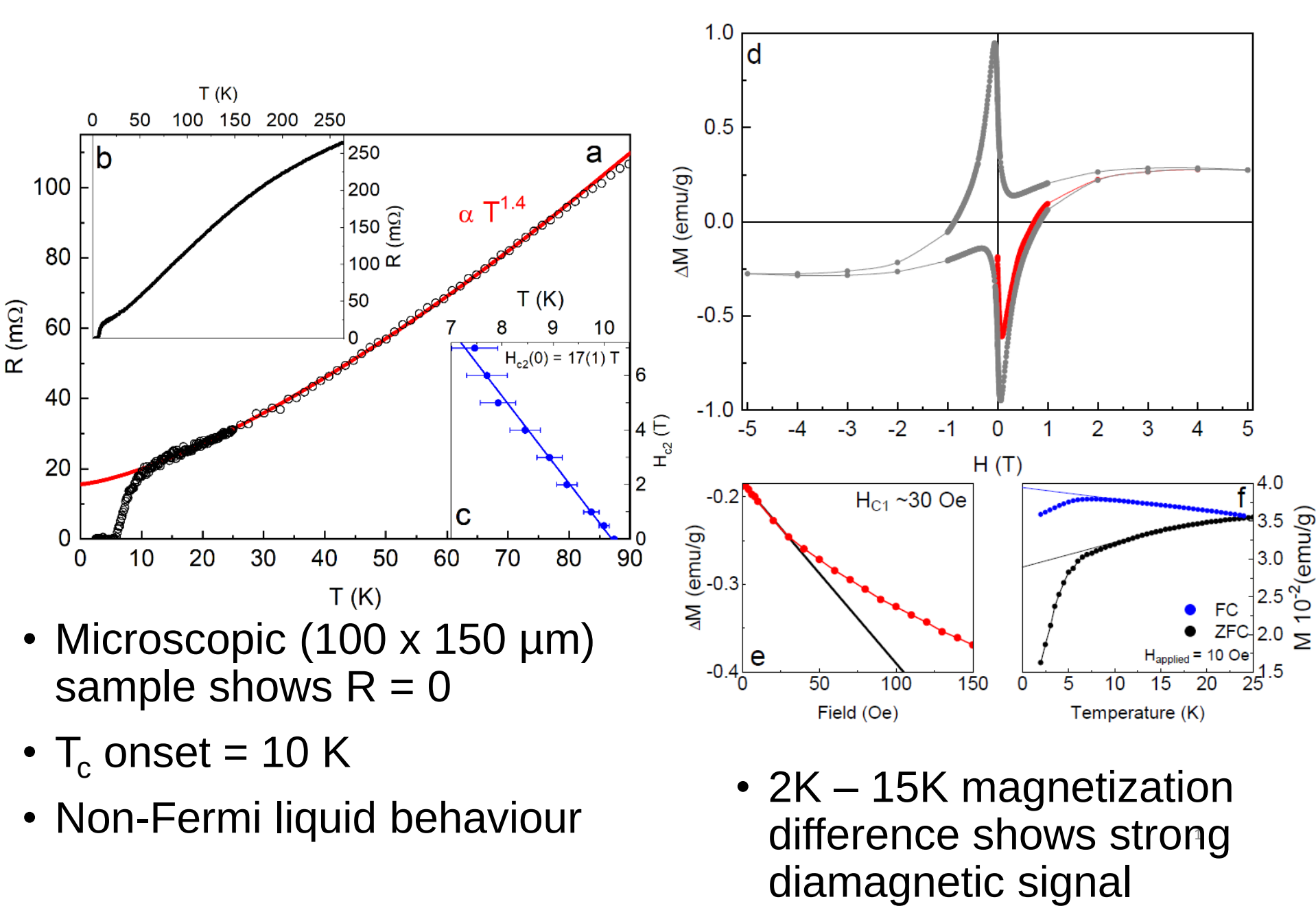
ABSTRACT

Below a critical temperature T_c , some materials become superconducting, transporting charge carriers without dissipation and expelling external magnetic fields. A lot of different superconductor families exist and among them the iron-based superconductors (IBS). Discovered in 2008, they exhibit the second highest T_c at normal pressure, next to copper oxides. But, such Fe-based compounds contain rather toxic elements like arsenic or selenium. In the last years new IBS were discovered with silicon or germanium in substitution of As/Se. Here we present a new member of the Fe-based silicide family, LaFeSiO_{1-δ} which is also found to be superconducting.

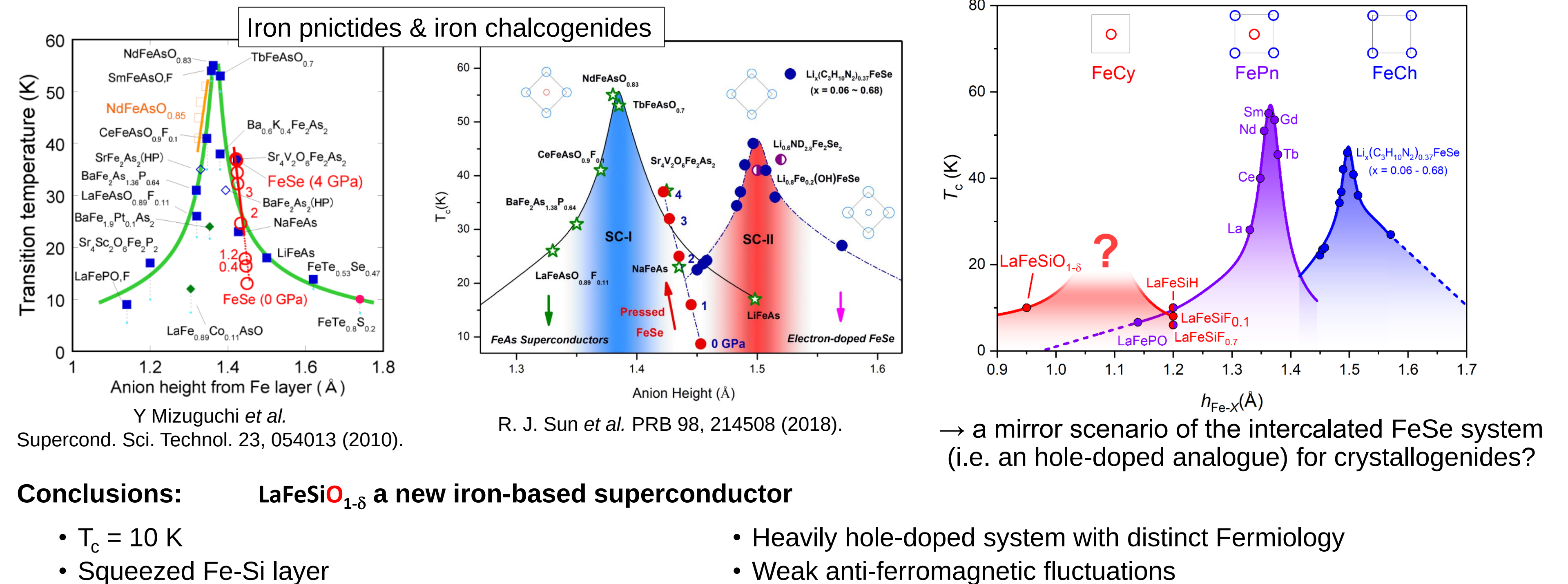


1

Electrical & magnetic properties

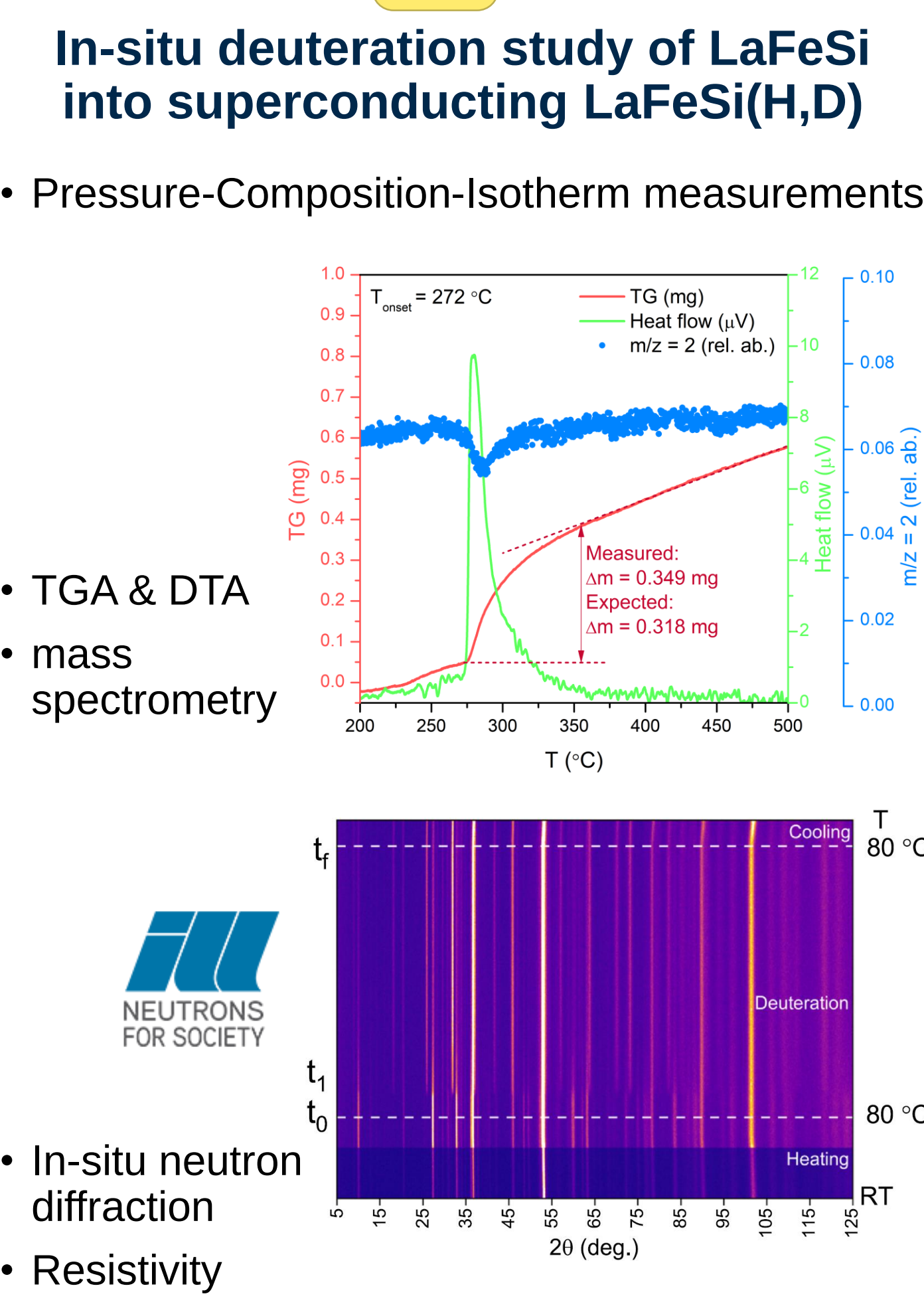
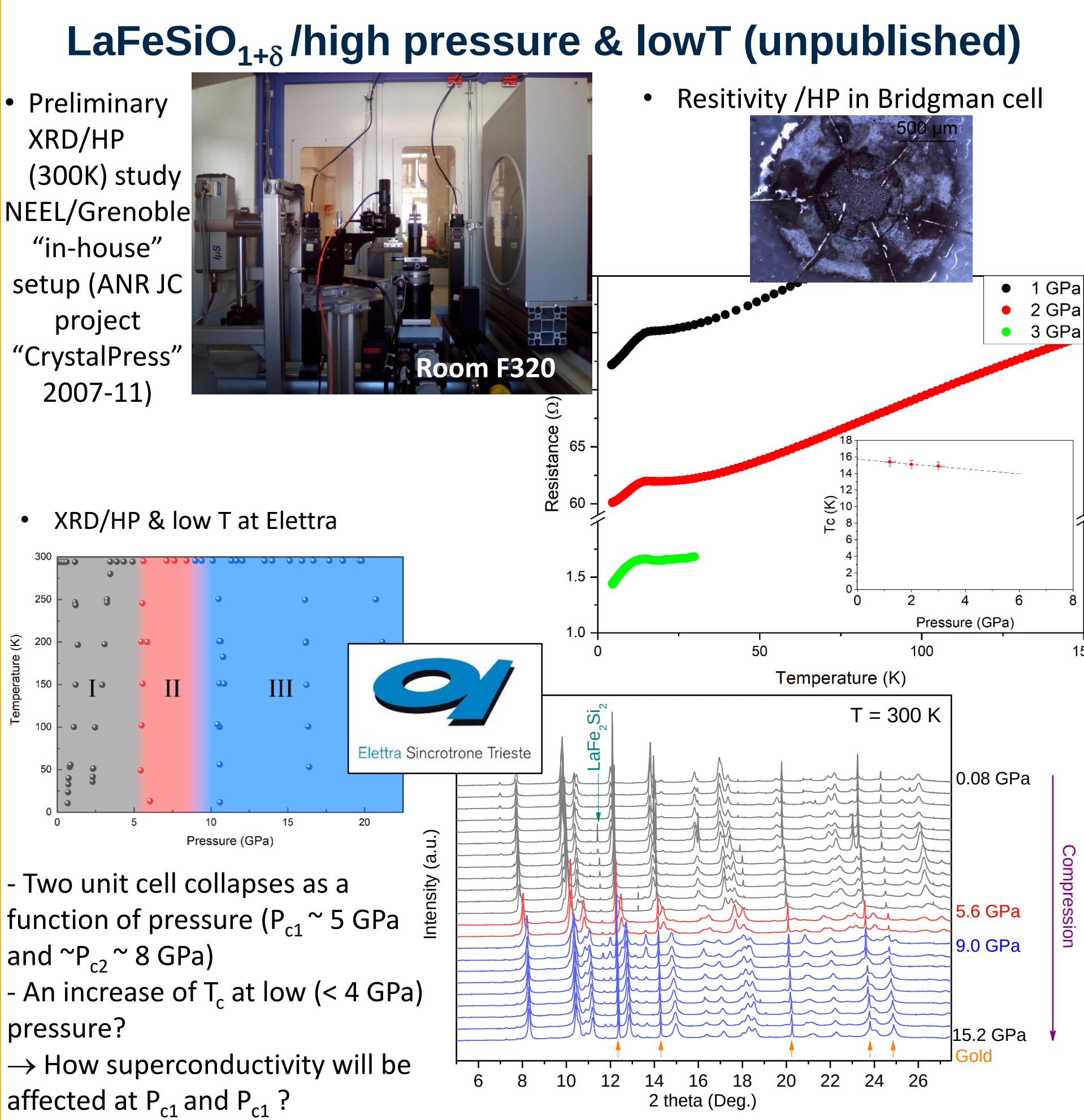


LaFeSiO_{1-δ} in the big picture of iron-based superconductors ?

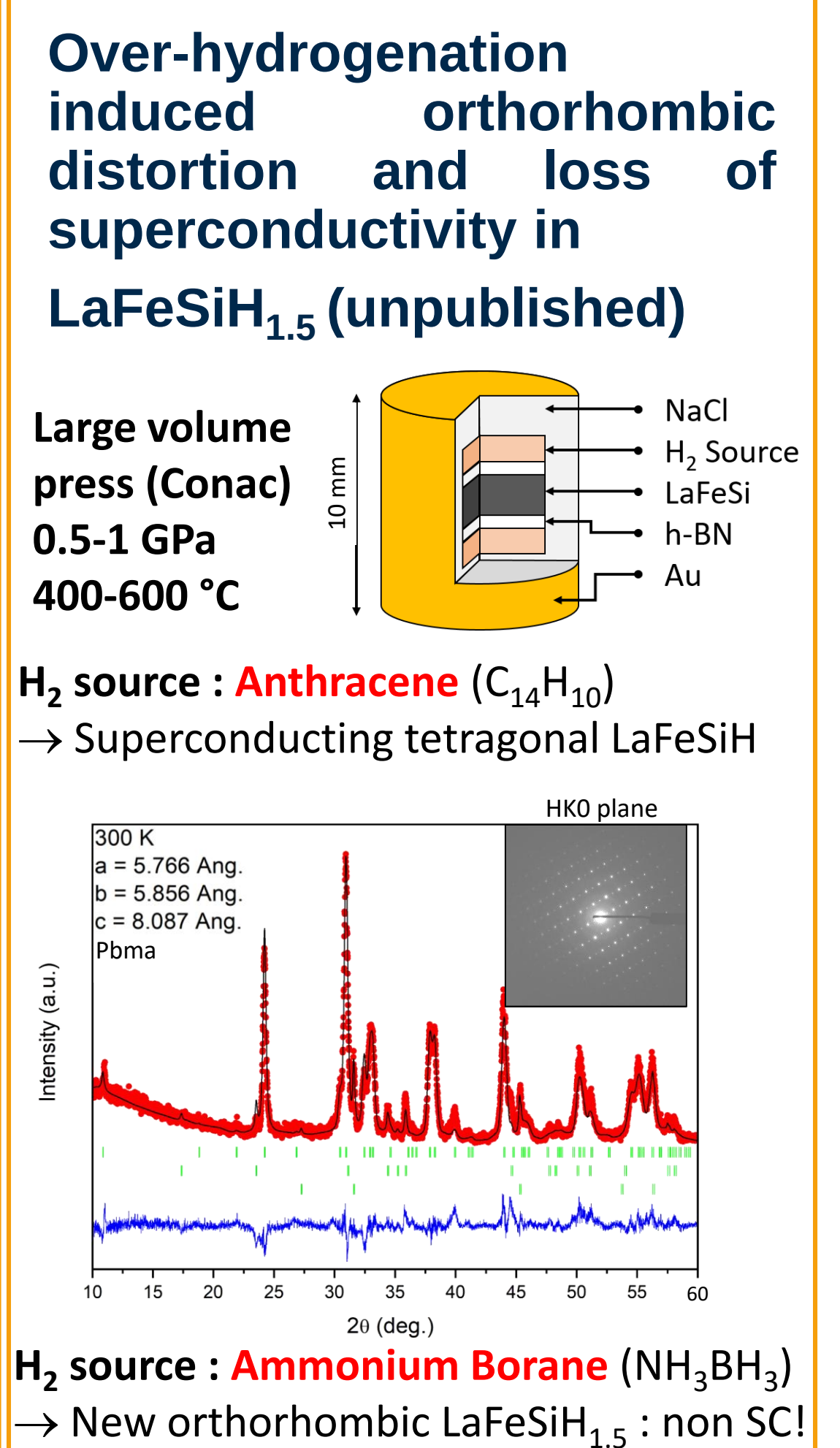
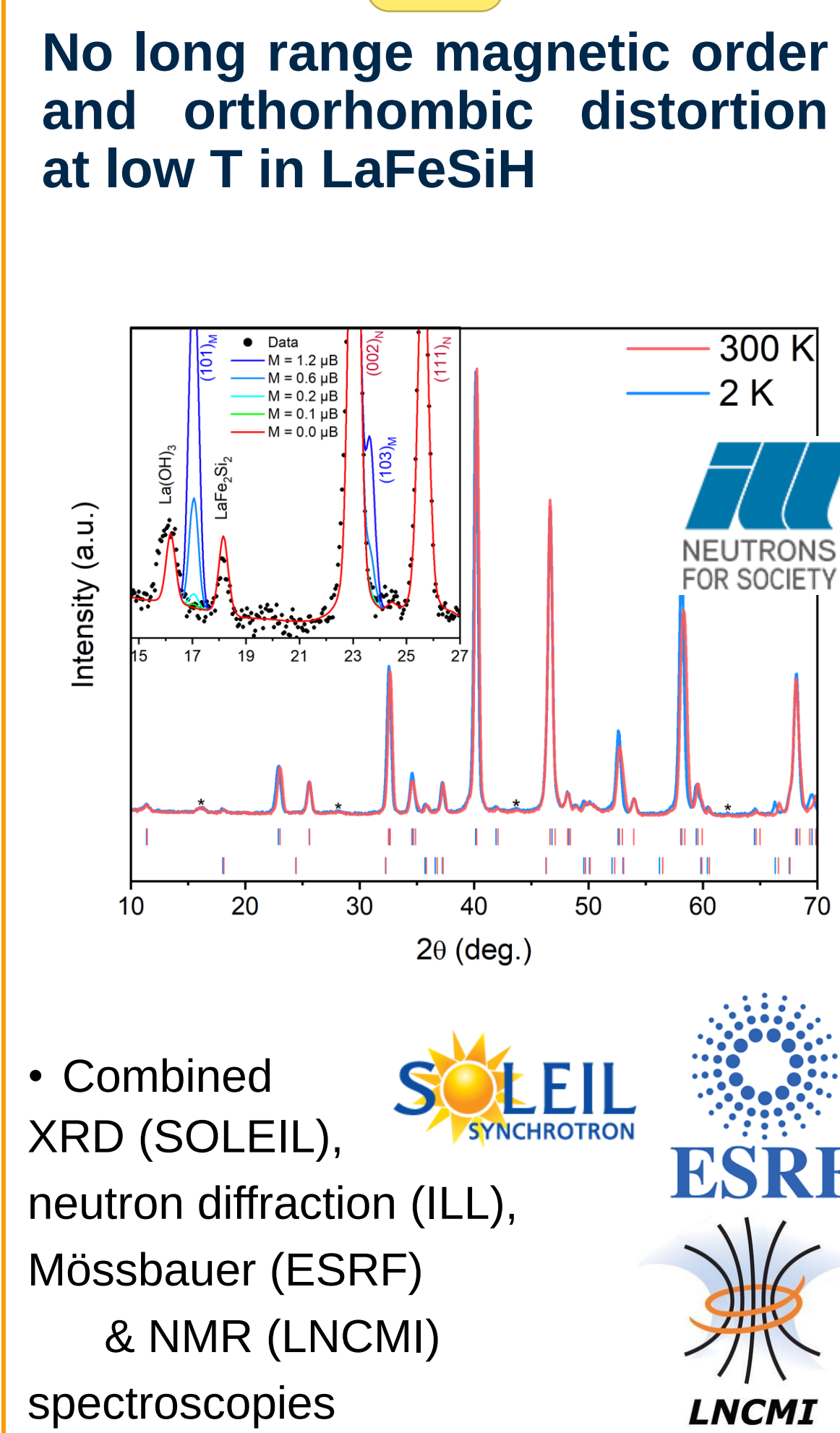


RELATED STUDIES

2



3



COLLABORATIONS, FUNDING & FURTHER READING

Collaborations: AutoCarac, CRG, Ingénierie expérimentale, X'Press support groups + MagSup & TMC research teams (NEEL), LNCMI, ILL, ICMCB (Bordeaux), CRISMAT (Caen), Università di Cagliari (Italy).

Projects: ANR « IronMan » **Funding:** LANEF

1

“Superconductivity in the crystallogene LaFeSiO_{1-δ} with squeezed FeSi layers”, M. F. Hansen, J.-B. Vaney, C. Lepoittevin, F. Bernardini, E. Gaudin, V. Nassif, M.-A. Méasson, A. Sulpice, H. Mayaffre, M.-H. Julien, S. Tencé, A. Cano and P. Toulemonde, npj Quantum Mater. 7, 86 (2022).

2

“In-situ deuteration study of LaFeSi into superconducting LaFeSi(H,D)”, M. F. Hansen, J.-B. Vaney, P. de Rango, M. Salaun, S. Tencé, V. Nassif and P. Toulemonde, Journal of Alloys and Compounds 945, 169281 (2023).

3

“Magnetic and structural properties of the iron silicide superconductor LaFeSiH”, M. F. Hansen, S. Layek, J.-B. Vaney, L. Chaix, A. Cano, S. Tencé, P. Toulemonde, M.-H. Julien, M. d’Astuto *et al.* Physical Review B 109 (17), 174523 (2024).

“Lattice dynamics in the FeSi-based family of superconductors” S. Layek, M. F. Hansen, J.-B. Vaney, P. Toulemonde, S. Tencé, P. Boullay, A. Cano and M.-A. Méasson, Europhysics Letters 146 (4), 46002 (2024).