



# GEMaC

Groupe d'Étude  
de la Matière Condensée

## AXE PHYSIQUE DES MATÉRIAUX MULTIFONCTIONNELS - PUBLICATIONS ET THÈSES

### Thèses en cours / Current PhDs

» MADACI Ismail (02/2020 - 02/2023)

**"Injection et détection de spin dans des nanostructures à base d'oxydes de fer /  
Spin injection and detection in iron oxide nanostructures"**

*Directeur de thèse DUMONT Yves, co-directrice POPOVA Elena, co-directeur  
VENNEGUES Philippe (CRHEA)*

» ZEYU Chi (10/2020 - 10/2023)

**"Étude de l'oxyde de gallium pour des électroniques de puissance et haute  
fréquence : du matériau au dispositif / Gallium Oxide for Next Generation  
Energy Electronics"**

*Directeur de thèse DUMONT Yves*

» Mamadou N'diyaye (2019-2022), cotutelle Dakar/UVSQ

**"Visualisation et modélisation de la dynamique spatio-temporelle des matériaux à transition de spin"**

*Directeur de thèse* Kamel Boukhezzaden

» Nour Belmouri (2021-2024)

**"Observation et modélisation spatio-temporelles de transitions de phases du 1er ordre dans les solides moléculaires à transitions de spins photo- et thermo-commutables"**

*Directeur de thèse* Kamel Boukhezzaden

» Thèses soutenues FOX /Defended PhDs FOX

» Thèses soutenues P2MC /Defended PhDs P2MC

## Publications 2022 -

### **2023**

E. Chikoidze, J. Leach, Z. Chi, J. von Bardeleben, B. Ballesteros, A.-M. Gonçalves, T. Tchelidze, Y. Dumont, A. Pérez-Tomás,

**"Surface Two-Dimensional Hole Gas in Si doped -Ga<sub>2</sub>O<sub>3</sub> Thin Film"**,

J. Alloys and Compounds (2023) – [HAL]

Z. Chi, C. Sartel, Y. Zheng, S. Modak, L. Chernyak, C.

M Schaefer, J. Padilla, J. Santiso, A. Ruzin, A.-M. Gonçalves, J. von Bardeleben, G. Guillot, Y. Dumont, A. Pérez-Tomás, E. Chikoidze,

**"Native defects association enabled room-temperature p-type conductivity in -Ga<sub>2</sub>O<sub>3</sub>"**,

J. Alloy and Compounds (2023) – [HAL]

A. Grishin, B. Bérini, M. Vallet, S. Hurand, F. Maudet, C. Sartel, M. Frégnaux, S. Nowak, G

"Tailoring crystallisation of anatase TiO<sub>2</sub> ultra-thin films grown by atomic layer deposition using 2D oxides as growth template",

Appl. Surf. Sci. **641**, 158446 (2023) – [HAL]

A. Slimani et K. Boukheddaden,

"Asymmetric self-organization accompanying a thermoinduced spin transition with symmetry breaking: Microscopic modeling",

Phys. Rev. B, vol. 108, no 6, p. 064107, août 2023, doi: 10.1103/PhysRevB.108.064107.

S. B. Ogou, T. D. Oke, M. Karimou, F. Hontinfinde, et K. Boukheddaden,

"BEG spin-1 model with random exchange magnetic interactions for spin-crossover solids",

J. Phys.: Condens. Matter, vol. 35, no 45, p. 455704, août 2023.

I. Benguettat-El Mokhtari and D. S. Schmool,

"Ferromagnetic Resonance in Magnetic Oxide Nanoparticles: A Short Review of Theory and Experiment",

Magnetochemistry **9**, 191 (2023)

S. Bolarinwa Ogou, T. Djidjoho Oke, M. Karimou, F. Hontinfinde, and K. Boukheddaden,

"BEG spin-1 model with random exchange magnetic interactions for spin-crossover solids",

J. Phys.: Condens. Matter **35**, 455704 (2023)

R. Traiche, H. Oubouchou, et K. Boukheddaden,

"Electro-Elastic Modeling of Multi-Step Transitions in Two Elastically Coupled and Sterically Frustrated 1D Spin Crossover Chains"

Crystals **13**, 937 (2023)

L. Sun, N. E. I. Belmouri, M. Ndiaye, K. Robeyns, A. Rotaru, K. Boukheddaden, et Y. Garcia

"Thermal-Driven Guest-Induced Spin Crossover Behavior in 3D Fe(II)-Based Porous Coordination Polymers"

Crystal Growth & Design, vol. 23, no 5, p. 34023411, mai 2023

C. Cazelles, M. Ndiaye, P. Dahoo, J. Linares, et K. Boukheddaden

**"Surface-Bulk 2D Spin-Crossover Nanoparticles within Ising-like Model Solved by Using Entropic Sampling Technique"**

Magnetochemistry, vol. 9, no 3, p. 61, mars 2023

Z. Chi, T. Tchelidze, C. Sartel, T. Gamsakhurdashvili, I. Madaci, H. Yamano, V. Sallet, Y. Dumont, A. Pérez-Tomas, F. Medjdoub,

**"Assessment of Large Critical Electric Field in Ultra-wide Bandgap p-type Spinel ZnGa<sub>2</sub>O<sub>4</sub>",**

J. Phys. D (2023)

**2022**

K. Boukheddaden, S. Miyashita, et S. Triki

**"Spin transition materials: Molecular and solid-state"**

Journal of Applied Physics, vol. 132, n° 22, p. 220402, déc. 2022

L. Sun, M. Ndiaye, N. El Islam Belmouri, et al.

**"Spin Crossover Coordination Polymers with Pyridine-Like Modification through Selective Guest Molecules"**

Crystal Growth & Design, vol. 22, n° 12, p. 75557563, déc. 2022

N. Pittala, E. Cuza, D. Pinkowicz, et al.

**"Antagonist elastic interactions tuning spin crossover and LIESST behaviours in Fell trinuclear-based one-dimensional chains"**

Inorg. Chem. Front., vol. 9, n° 24, p. 64686481, déc. 2022

N. di Scala, N. E. I. Belmouri, M. A. P. Espejo, et K. Boukheddaden

**"Explaining the origin of the orientation of the front transformation in spin-transition crystals"**

Phys. Rev. B, vol. 106, n° 14, p. 144107, oct. 2022

Y. Singh, K. Affes, N.-I. Belmouri, et K. Boukheddaden

**"Clamping of spin-crossover solid inducing crystal bending and spatial spin organization"**

Materials Today Physics, vol. 27, p. 100842, oct. 2022

N. di Scala, N. E. I. Belmouri, M. A. P. Espejo, et K. Boukheddaden

**"Three-dimensional electroelastic modeling of the nucleation and propagation of the spin domains in spin-crossover materials"**

Phys. Rev. B, vol. 106, n° 1, p. 014422, juill. 2022

S. Modak, Al. Schulte, C. Sartel, V. Sallet, Y. Dumont, E. Chikoidze, X. Xia, F. Ren, S. J. Pearton, A. Ruzin, L. Chernyak,

**"Impact of radiation and electron trapping on minority carrier transport in p-Ga<sub>2</sub>O<sub>3</sub>"**

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Appl. Phys. Lett. **120**, 233503 (2022)

M. Ndiaye et K. Boukheddaden

**"Pressure-induced multi-step and self-organized spin states in an electro-elastic model for spin-crossover solids"**,

Phys. Chem. Chem. Phys., vol. 24, n° 21, p. 1287012889, juin 2022

H. Fourati, M. Ndiaye, M. Sy, et al.

**"Light-induced thermal hysteresis and high-spin low-spin domain formation evidenced by optical microscopy in a spin-crossover single crystal"**

Phys. Rev. B, vol. 105, n° 17, p. 174436, mai 2022

C. Cazelles, J. Linares, P.-R. Dahoo, et K. Boukheddaden

**"A Generalized Ising-like Model for Spin Crossover Nanoparticles"**

Magnetochemistry, vol. 8, n° 5, p. 49, mai 2022

M. Dallocchio, A. Boileau, B. Mercey, A. David, U. Lüders, S. Froissart, X. Larose, B. Bérini, Y. Dumont, A. Pautrat, W. Prellier, A. Fouchet,

**"Tunable magnetic and magnetotransport properties in locally epitaxial La\_0.67 Sr\_0.33 MnO\_3 thin films on polycrystalline SrTiO\_3, by control of grain size"**,

J. Phys. D: Appl. Phys. **55**, 235303 (2022) – [HAL]

Z. Chi, J.J. Asher, M.R. Jennings, E. Chikoidze, A. Pérez-Tomás,

**"Ga<sub>2</sub>O<sub>3</sub> and Related Ultra-Wide Bandgap Power Semiconductor Oxides: New Energy Electronics Solutions for CO<sub>2</sub> Emission Mitigation"**,

Materials **15**, 1164 (2022) – [HAL].

M. Itoi, I. Maurin, K. Boukheddaden, et al.

**"Sub-micrometer particle size effects on metastable phases for a photoswitchable**

## **Co-Fe Prussian blue analog"**

Journal of Applied Physics, vol. 131, n° 8, p. 085110, févr. 2022

V. Cantelli, S. Guillemin, E. Sarigiannidou, F. Carlá, B. Bérini, J.-M. Chauveau, D. Fong, H. Renevier, V. Consonni

**"In situ analysis of the nucleation of O-and Zn-polar ZnO nanowires using synchrotron-based X-ray diffraction"**

Nanoscale, Royal Society of Chemistry **14**, D1NR06099F (2022) - [HAL]

P. Chakraborty, M. Sy, H. Fourati, et al.

**"Optical microscopy imaging of the thermally-induced spin transition and isothermal multi-stepped relaxation in a low-spin stabilized spin-crossover material"**

Phys. Chem. Chem. Phys., vol. 24, n° 2, p. 982994, janv. 2022

K. Affes, Y. Singh, et K. Boukheddaden,

**"Electro-Elastic Modeling of Thermal Spin Transition in Diluted Spin-Crossover Single Crystals"**

International Journal of Molecular Sciences, vol. 23, n° 22, p. 13854, janv. 2022

Publications 2018-2021 FOX

Publications 2015 - 2021 P2MC

Publications 2013 - 2017 FOX

Publications 2010 - 2014 P2MC

Publications 2008 - 2012 FOX

Publications 2006 - 2009 P2MC