Arij Ben Lakhdher

PHD STUDENT AT UNIVERSITY OF TUNIS EL MANAR

Supervisor: Professor Rachid Belhi

PROFIL

My academic background reflects my deep passion for physics and a keen interest in Materials Science, equipping me with the versatility to engage with various disciplines and complex topics.

I am a motivated and dynamic student, driven by a strong desire to succeed. I am committed to continuous learning and enthusiastic about contributing to multidisciplinary projects, always seeking to expand my skillset and knowledge.

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EXPERIENCE

CentraleSupélec, Université PARIS SACLAY, [01/09/2024 – 29/11/2024]:
I undertook a three-month internship at CentraleSupélec under the supervision of Professor Brahim DKHIL. My work focused on the synthesis and study of new materials for magnetic refrigeration and photocatalysis.

Julich Center for Neutron Science, Forschungzentrum, Germany, [01/09/2023 – 29/11/2023]:
I undertook a three-month internship at the Julich Forschungzentrum, where I focused on investigating the magnetic and magnetocaloric properties of ceramic oxides and thin films using VSM and SQUID techniques, under the guidance of Professors Karen Freise and Manuel Angst.

Advanced Materials and Thermal Physics Laboratory at University of Hassan II, Casablanca [01/05/2023 – 15/06/2023] :
I successfully finished an internship at Hassan 2 University in Casablanca, Morocco, where I was engaged in the synthesis of ceramic oxides using the solid-state reaction method, along with DFT calculations. Mr. Ridha Moubah provided invaluable guidance and supervision throughout the internship.

LMOP Laboratory (Laboratoire Matériaux Organisation et Propriétés) at University of Tunis el Manar [03/2021 - 12/2021]:
I completed an internship as a graduate student under the supervision of Professor Rachid Belhi, where I worked on **spintronics**, specifically studying the effect of annealing temperature on the magnetic properties of $(Pt/Co)_5/NiO$ multilayers. I successfully defended my project at the end of the internship.

IPEST (Institut Préparatoire aux Études Scientifiques et Techniques) :
I carried out a summer internship focused on Density Functional Theory (DFT) using VASP, under the supervision of Professor Fayçal Raouafi.

LSAMA Laboratory (Laboratoire Spectroscopies Atomique Moléculaire et Applications) at University of Tunis el Manar [06/2020-07/2020] :
I completed an internship under the supervision of Professor Mourad Telmini, where I developed a Python program to calculate the eigenvalues and eigenvectors of an Optical Lattice Hamiltonian.

ACADEMIC BACKGROUND

Master’s degree in Nanophysique et Nanotechnologies
University of Tunis el Manar (2019-2021)

Bachelor's degree in Physics
University of Tunis El Manar (2014-2019)

SKILS

- Python (data plotting and curve fitting)
- OriginLab (data analysis and graphing software)
- FullProf (Rietveld refinement and crystallographic analysis)
- Quantum Espresso / Wien2k / VESTA (DFT calculations and structural visualization)

AREAS OF EXPERTISE

- Synthesis of powders (Sol-Gel, Solid-State Reaction) and thin films (Spin Coating)
- **Biosynthesis**
- Magnetic materials and their applications (**Spintronics**, **Magnetocaloric effect**)
- **Nanomagnetism** (Strong background in nanomagnetism, magnetic anisotropy, domain structures, and domain walls, with expertise in analyzing materials exhibiting these properties)
- Characterization techniques: XRD, TEM, SEM, XPS, Raman Spectroscopy
- DFT simulations (Wien2k, Quantum Espresso)
- **Magnetometry techniques** (Kerr Effect, Dynacool VSM, SQUID)