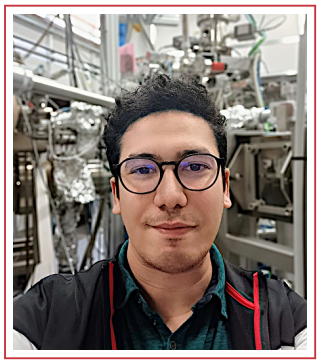

AYMEN MAHMOUDI

Postdoctoral researcher since November 2024

Objective statement

Science has been an integral part of my life since I was a teenager. My curiosity and my analytical mind allow me to move quickly in this area, and my studies offer me many opportunities to explore and go deeper each time. As a highly motivated young researcher, I am seeking a challenging position in the research field where I can leverage my technical skills. My passion for science and my curiosity push me to do all I can to deliver high-quality research work that meet both fundamental science and real needs.

Contact

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Work Experience

Nov 2024 - **Postdoctoral researcher**, Group Monney *Fribourg, Switzerland*, .
After completing my PhD, I had the opportunity to join Monney's Group, where I am continuing my research on out-of-equilibrium systems using time-resolved photoemission spectroscopy. This allows me to deepen my exploration of dynamic states and broaden my expertise in advanced experimental techniques.

Sep-Mar 2023-24 **Instructor**, Polytech, IUT de Sceaux *Orsay, France*, .
During my third year of PhD, I had teaching responsibilities for 68 hours in Polytech and IUT de Sceaux (Université Paris-Saclay).

Feb. 2022 **Instructor**, Polytech *Palaiseau, France*, .
During my first year of PhD, I did 16 hours of vacations at Polytech.

Feb-Jul 2021 **M2 Internship**, Grapheal *Grenoble, France*, .
The internship was conducted with the Grapheal team under the supervision of Mr. Vincent Bouchiat.
During this experience, I worked on improving the scalability of graphene on parylene by optimizing the growth and transfer processes and enhancing the graphene quality by implementing a backside doping technique.
Several characterization techniques were used, such as AFM, SEM, Field effect measurement, and Raman.

May-Jui 2020 **M1 Internship**, Institute of Physics of Rennes (IPR) *UMR CNRS 6251*, .
The internship was conducted in the photoemission analysis laboratory under the supervision of Mrs. Ababou-Girard Soraya.
During this experience, I became familiar with the XPS technique I used to analyze functionalized surfaces.

July–Aug 2019 **L3 Internship**, LSAMA-laboratory *Tunis, Tunisia*, .
The internship was under the supervision of Mr. Hassen Ghalila and Mr. Ahmed Ammar.
During this experience, I performed the analysis of captured radio frequencies triggered by lightning to estimate their distances to our receiving system.

Sep-Feb 2020-21 **Part time student jobs**, University library *Rennes, France*, .
As an instructor, I was responsible for the shelf's organization and ensuring the loan and return processes. This experience offered me an integration in a complete working environment.
https://bibliotheques.univ-rennes1.fr/temoignages/aymen

I also used to give part-time courses to students.

Conferences, Sem(web)inars, Schools and Workshops

During my academic cursus, I attended several national and international conferences, in which I have participated with oral presentations or posters. I have also followed multiple training and seminars on various topics (Photoemission techniques, lasers, AFM techniques, soft and computer skills, publishing issues, moocs, etc) offered by ADUM, the doctoral school, or IFSeM-CNRS platform. Aside from the scientific events, I kept myself up-to-date with the social events to increase my personal development. (Most of the events and the talks I gave were in English). Here is a list of selected events. Find a complementary list in the Event tab on my webpage

May. 2024 **JNSPE 2024 [Poster presentation]**, *FRSPE, Institut Chevreul*, Lille, France.

Mar. 2024 **Plenary meeting of the materials' department [Oral presentation]**, *C2N*, Palaisau, France.

Mar. 2024 **Nanooptics and machine learning for analysis of biological nanoparticles**, *Olav Gaute Hellesø, UiT the Arctic University (Tromsø, Norway)*, C2N, Palaisau, France.

Fev. 2024 **Presentation of our group collaboration to the 2D-on-demand ANR project [Oral presentation]**, *IRAMIS-CEA and Thales group*, C2N, Palaiseau, France.

Jan. 2024 **Epitaxial growth of III-V semiconductor heterostructures by CBE and MBE**, *Omer ARIF, NEST, Istituto Nanoscienze CNR and Scuola Normale Superiore (Pisa-Italy)*, C2N, Palaisau, France.

Jan. 2024 **Career development workshop**, *EDPIF*, ENS, Paris, France.

Nov. 2023 **RamanFest2023 [Oral & Poster presentations]**, *HORIBA, PHANTOMS*, Paris, France.

Oct. 2023 **Visit of lab and discussion of mixDferro ANR project [Oral presentation]**, *Chemical Physics and Dynamics of Surfaces Team*, INSP, Jussieu, France.

Oct. 2023 **Taking action against gender-based and sexual violence**, *Univ Paris-Saclay*, Online interactive course.

May 2023 **The GDR HOWDI colloquium 2023 [Oral presentation]**, Island of Porquerolles, France.

Apr. 2023 **OPERA workshop: Fundamental research – New Materials [Oral presentation]**, *The EU COST Action OPERA*, Madrid, Spain.

Mar. 2023 **Research ethics and scientific integrity**, *FUN-MOOC*, Online course.

Jan. 2023 **Quantum emitters in 2D systems (GDR) [Poster presentation]**, *CRHEA, CNRS*, Côte d'Azur, France.

Jan. 2023 **Photoelectron spectroscopy with UV/UPS radiation: principle and examples**, *CNRS/UVSQ*, Virtual meeting.

Dec. 2022 **30th Alain Bouyssy Colloquium [Poster presentation]**, *University of Paris-Saclay, SFP*, Orsay, France.

Nov. 2022 **SPiCY School**, *University of Paris-Saclay, CNRS, Thales*, Orsay, France.

Oct. 2022 **NanoScientific Symposium**, *Park Systems*, Virtual meeting.

Sep. 2022 **Visit of lab and discussion of mixDferro ANR project [Oral presentation]**, *Nanodevices Team*, IPCMS, Strasbourg, France.

Sep. 2022 **RamanFest2022 [Poster presentation]**, *HORIBA, PHANTOMS*, Paris, France.

Aug. 2022 **Journées de la matière condensée (JMC2022) [Poster presentation]**, Lyon, France.

May 2022 **The GDR HOWDI colloquium 2022 [Poster presentation]**, Dourdan, France.

May 2022 **Fifth edition of the NanoTN symposium**, Marrakech, Morocco.

Dec. 2021 **Python for physics school**, *Sorbonne University, EDPIF*, Paris, France.

Aug. 2020 **NanoteC20 Conference**, *University of Survey UK*, Virtual meeting.

Mar. 2019 **Spring school on digital physics**, *Tunisian Physical Society STP*, Tunis, Tunisia.

Dec. 2018 **Winter school on magnetism**, *Tunisian Physical Society STP*, Tunis, Tunisia.

Publications

Oct. 2024 Distinguishing different stackings in WSe_2 bilayers grown using chemical vapor deposition, *Phys. Rev. B 110, 165418 (2024)*

Sep. 2024 Direct Reconstruction of the Band Diagram of Rhombohedral-Stacked Bilayer WSe_2–Graphene Heterostructure via Photoemission Electron Microscopy, *ACS Appl. Electron. Mater. 6, 9, 6484–6492 (2024)*

July. 2024 Anisotropic flat band and charge density wave in quasi-one-dimensional indium telluride, *Phys. Rev. B 110, 045441 (2024)*

June. 2024 Van der Waals epitaxial growth of few layers WSe_2 on $GaP(111)_B$, *2D Mater. 11 035031 (2024)*

Mar. 2024 Stacking order and electronic band structure in MBE-grown trilayer WSe_2 films, *Phys. Rev. B 109, 115437 (2024)*

Oct. 2023 Quasi van der Waals Epitaxy of Rhombohedral-Stacked Bilayer WSe_2 on GaP(111) Heterostructure, *ACS Nano 2023, 17, 21, 21307–21316 (2023)*

Oct. 2023 Reconfigurable Multifunctional van der Waals Ferroelectric Devices and Logic Circuits, *ACS Nano 2023, 17, 21, 21865–21877 (2023)*

Sep. 2023 Intrinsic defects and mid-gap states in quasi-one-dimensional Indium Telluride, *Phys. Rev. Research 5, 033152 (2023)*

Aug. 2023 Quantum Confinement and Electronic Structure at the Surface of van der Waals Ferroelectric α-In_2Se_3, *ACS Nano 2023, 17, 19, 18924–18931 (2023)*

Jul. 2023 Direct observation of highly anisotropic electronic and optical nature in indium telluride, *Phys. Rev. Materials 7, 074601 (2023)*

Jul. 2023 Electronic properties of rhombohedral-stacked bilayer WSe_2 obtained by Chemical Vapor Deposition, *Phys. Rev. B 108, 045417 (2023)*

Mar. 2023 Photoferroelectric All-van-der-Waals Heterostructure for Multimode Neuromorphic Ferroelectric Transistors. , *ACS Appl. Mater. Interfaces, 15, 12, 15732–15744 (2023)*

Feb. 2022 Evidence for highly p-type doping and type II band alignment in large scale monolayer WSe_2/Se-terminated GaAs heterojunction grown by molecular beam epitaxy, *Nanoscale, 2022, 14, 5859-5868 (2022)*

Education

2021–2024 **PhD degree (Electronic properties of two-dimensional transition metal dichalcogenides)**, *Joint research unit CNRS / Paris-Saclay University (Centre for nanoscience and nanotechnology C2N)*, France.
My Ph.D was in the MAT2D team in C2N under the supervision of Dr. Abdelkarim Ouerghi. I was mainly interested in transition metal dichalcogenides (TMDs), which are promising materials for channeling applications due to their specific properties. I am studying their optoelectronic properties via optical and photoemission facilities.

2019–2021 **Master degree in Physics (Nanosciences branch)**, *University of Rennes 1 and University of Nantes (double diploma)*, France.
Solid state physics, advanced quantum mechanics, nanoelectronics, nanophysics, nanobiology, DFT, etc.
Surface characterization (STM, SEM, TEM, XPS), clean room work (lithography, elaboration and characterization of thin films), etc.
Arduino and C/C++
Distinction: 14.68/20 (good). Rank 2/10.

2016–2019 **Bachelor's degree in fundamental physics**, *University of Tunis ElManar*, Tunisia.
Classical physics, electromagnetism, wave physics, electronics, general chemistry, mathematics, particle physics, solid state physics, quantum mechanics, MATLAB for data analyzing, etc.
Distinction: 15.46/20 (good). Laureate at the national level.

2016 **Baccalaureat diploma (mathematics branch)**, *Ibn Rochd and Ibn Sina secondary school*, Menzel Bourguiba (Benzart), Tunisia.
General physics and mathematics, humanities, German language, etc.
Distinction: 15.72/20 (good). Laureate at the regional level.

2012 **National competition for basic education**, *Ibn Charaf preparatory school*, Menzel Bourguiba (Benzart), Tunisia.
Basic scientific notions, literary, French, English, etc.
Distinction: 14.52/20 (good). Laureate at the regional level.

Computer skills

OS	Windows (cmd/PowerShell), Debian GNU/Linux (Ubuntu/Mint) and Mac OS (Bash/Zsh)
Office suite	MS Office/Office 365, LibreOffice, iWork and G Suite
Photoemission	IgorPro, CasaXPS, and KolXPD
Data analysis	OriginLab, LabSpec, Python (NumPy, Pandas, Matplotlib)
SPM	Nanoscope, WSxM, Gwyddion, XEI, and ImageJ
Im Processing	Python (OpenCV, Scikit-learn), MatLab
Visualization	VESTA/XCrySDen, GIMP/PS, Inkscape, Synfig, Blender, Filmora/Kidenlive/Shotcut/Pr
Markup/Web	LaTeX, Markdown/RST, HTML/CSS/Bootstrap, and JS
Others	Python GUI (Tkinter, PyQT), C/C++, Arduino, Klayout, PuTTY, Thunderbird, FileZilla, Cobian, DAW (FL/S1/Reaper/Audacity/Au

Personal skills

- ❍ Good scientific writing skills (papers/reports)
- ❍ Teamwork and high Willingness to learn
- ❍ Ideas creator and self-motivated to put them under test
- ❍ Good computer handling skills
- ❍ Open minded and associative personality

Languages

English	**Academic**	*excellent command*
French	**Near Native**	*excellent command*
German	**Beginner**	*basic conversation*
Arabic	**Native**	*mastery of all dialects*

Additional Info & Declaration

Single, 27 year-old

Driving licence B

All vaccinations are up-to-date (Covid, DTP, etc); I have a slight stutter

I hereby declare that the information mentioned above or on the webpage is correct.

Date: November, 2024

Place: Fribourg-Switzerland