

Khouloud ABID | Curriculum Vitae

Address: [REDACTED]

Nationality: Tunisian

Date of Birth: [REDACTED]



[REDACTED]
khouloud.abid.etud@fss.usf.tn/ khabid@unime.it / khouloudabid@cnr.it

Affiliations:

- Department of Engineering, University of Messina, I-98166 Messina, Italy
- CNR IPCF Istituto per i Processi Chimico-Fisici, viale F. Stagno D'Alcontres 37, I-98156 Messina, Italy
- Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" (ITAE), Salita S. Lucia sopra Contesse n. 5 98126 – Messina, Italy

Scientific Background

I am a researcher in physics and chemistry. I am interested in synthesis of two-dimensional (2D) materials, plasmonic nanoparticles and their hybrid/nanocomposites. I am interested to study the features of these materials and their performance in the sensing field especially, plasmonic, electrochemical, optical and fluorescent. I am able to work with Raman, PL, UV-Vis, FTIR and AFM techniques. I am open also to learn new skills.

EDUCATION

Diploma of doctorate in 'Engineering and Chemistry of Materials and Constructions' and Diploma of doctorate in Condensed physics specialized in nanomaterials. 19/12/2019- 12/12/2022

Department of Engineering, University of Messina-Italy and Department of Physics, University of Sfax-Tunisia

- Title: "Development of Two-Dimensional (2D) Sensing Materials".
- Supervisor: Prof. Giovanni Neri and Prof. Ramzi Maalej/ Co-Supervisor: Prof. Pietro Gucciardi and Dr. Antonino Foti
- Competence: PIERS, SERS, synthesis plasmonic nanoparticles, synthesis 2D materials, sensing, electroanalytical technique, Raman, PL, UV, FTIR, AFM, synthesis of 2D nanocomposites
- Final decision: very good with written jury congratulations (in Tunisia)/ lode (in Italy)
- Delivered date: January 2023.
- Diplom are delivered from Faculty of sciences of Sfax-University of Sfax-Tunisia and University of Messina-Italy

Master in Physics

15/09/2017 - 06/12/2019

Department of Physics, University of Sfax-Tunisia

- Title: "PIERS and SERS Performance of MX₂-Au Nanomaterials for MBA Detection".
- Supervisor: Prof. Ramzi Maalej/ Co-Supervisor: Prof. Nour Hamza Blekhir
- Competence: PIERS, SERS, plasmonic nanoparticles, 2D materials, sensing
- Final decision: 18.5/20 (for the master defense with honors). 13.5/20 (for the two years of the master)
- Data di conseguimento: December 2019.
- Diplom is delivered from Faculty of sciences of Sfax-University of Sfax-Tunisia

Diploma of Bachelor of Physics and Chemistry

2014-2017

Faculty of Sciences of Sfax-Tunisia

◦ Principle courses: Chemistry, physics, informatics, English and French languages

Diploma of Baccalaureat (Mathematic)

2014

High School Maazoun, Sfax

◦ Final decision: 12.23/ 20; Near good

◦ Date: 21/06/2014

◦ Diploma delivered from Ministry of education of Tunisia

PARTICIPANTS IN SCHOOLS

◦ e-spark Summer school in electrochemistry

Date: 18-24 September 2022. **Location:** Warsaw-Poland

◦ The International School on Programmable Smart Sensors based on Bio-compatible Nanocomposite Materials (NanoSENS)- Online

Date: 17-24 June 2021

RESEARCH ACTIVITIES

Post Doctoral

01/04/2025 – 31/03/2026

Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" (ITAE), Salita S. Lucia sopra Contesse n. 5 98126 – Messina, Italy

Post Doctoral

01/02/2024 – 31/01/2025

CNR IPCF Istituto per i Processi Chimico-Fisici, viale F. Stagno D'Alcontres 37, I-98156 Messina, Italy

Post Doctoral

01/01/2023 – 31/01/2024

Department of Engineering, University of Messina-Italy

PROJECTS PARTICIPATION

◦ Title of project: PRIN 2022 FLASH 2D

Role: my research focuses on nanomaterials, especially on transition metal dichalcogenides "TMDCs" (MX₂; MoS₂, WS₂, MoSe₂). The synthesis of these nanosheets is done through liquid-phase exfoliation (LPE) followed by liquid cascade centrifugation (LCC). The features of nanosheets (NS) were investigated by atomic force microscopy (AFM) technique to provide high-resolution imaging, determining the thickness and analyzing the defects. In addition to AFM, the MX₂ NS will be studied using tip-enhanced spectroscopies (TEPL and TERS).

Period: From 01/01/2023 to 31/12/2023.

◦ Title of project: TEcnologie innovative per il controllo, il moniToraggio e la sIcurezza in mare (TETI)

Role: Development of electrochemical sensors for the determination of contaminants in seawater

Period: From 01/01/2023 to 31/12/2023.

◦ Title of project: SAMOTHRACE

Role: Development and characterization of a plasmonic sensor based on nanomaterials made of two-dimensional transition metal dichalcogenides in combination with noble metal nanoparticles for the detection of pollutants and toxins at low concentrations for applications of environmental interest.
Period: From 01/01/2023 to 30/06/2023.

PUBLICATIONS

◦ **February 2025: " Electrochemical Detection of Cadmium Ions (Cd²⁺) at Low Concentration by a modified 2D-MoS₂/SPCE"**

Khouloud Abid, Antonino Foti, Pietro Giuseppe Gucciardi, and Giovanni Neri. *Sensors and Actuators B Under Revision*

◦ **April 2025: " Electrochemical Determination of Heavy Metals by a Graphene Quantum Dots/Porphyrin-Based Supramolecular System**

Mariachiara Sarà, **Khouloud Abid**, Pietro Giuseppe Gucciardi, Luigi Monsù Scolaro, and Giovanni Neri. *Synthetic Metals*
DOI: [10.1016/j.synthmet.2024.117824](https://doi.org/10.1016/j.synthmet.2024.117824)

◦ **December 2024: " Novel gold nanoparticles-Schiff base electrochemical sensor for the determination of lead (II) ions in biological samples**

Zahra Akbari, **Khouloud Abid**, Daniela Iannazzo, Morteza Montazerzohori, and Giovanni Neri. *Bioelectrochemistry* (2024), DOI: [10.1016/j.bioelechem.2024.108886](https://doi.org/10.1016/j.bioelechem.2024.108886)

◦ **September 2024: " Lead ions (Pb²⁺) Electrochemical Sensors Based on Novel Schiff Base Ligands**

Zahra Akbari, **Khouloud Abid**, Daniela Iannazzo, Morteza Montazerzohori, Enza Fazio, Fortunato Neri, Carmelo Corsaro, and Giovanni Neri. *Environmental Science: Water Research & Technology* (2024), DOI: [10.1039/D4EW00485J](https://doi.org/10.1039/D4EW00485J)

◦ **May 2024: " Graphene quantum dots (GQDs)-modified screen-printed electrode for the determination of cannabidiol (CBD) in hemp seeds flour"**

K. Abid, A. Ferlazzo, G. Neri *FlatChem* (2024), DOI: [10.1016/j.flatc.2024.100673](https://doi.org/10.1016/j.flatc.2024.100673)

◦ **October 2023: " A study of Screen-Printed Electrodes Modified with MoSe₂ and AuNPs-MoSe₂ Nanosheets for Dopamine Sensing"**

Abid, K.; Foti, A.; Khaskhoussi, A.; Celesti, C.; D'Andrea, C.; Polykretis, P.; Matteini, P.; Iannazzo, D.; Maalej, R.; Gucciardi, P. G.; Neri, G. *Electrochimica Acta* **2023**, 143371. DOI : [10.1016/j.electacta.2023.143371](https://doi.org/10.1016/j.electacta.2023.143371)

◦ **July 2023: " A sensitive and selective non-enzymatic dopamine sensor based on nanostructured Co₃O₄-Fe₂O₃ hetero-junctions. "**

Khan, M.; **Abid, K.**; Ferlazzo, A.; Bressi, V.; Espro, C.; Hussain, M.; Foti, A.; Gucciardi, P.; Neri, G. *Chemosensors* **2023**, 11. DOI: [10.3390/chemosensors11070379](https://doi.org/10.3390/chemosensors11070379)

◦ **December 2022: "A novel 2D-GO@WS₂ electrochemical platform for the determination of thiram fungicide"**

Abid, K.; Iannazzo, D.; Celesti, C.; Khaskhoussi, A.; Foti, A.; Maalej, R.; Gucciardi, P. G.; Neri, G. *Journal of Environmental Sciences* **2024**, 136, 226–236. DOI: [10.1016/j.jes.2022.11.018](https://doi.org/10.1016/j.jes.2022.11.018)

◦ **November 2022:** "Electrochemical and Sensing properties of AuNps-2D-MoS2/SPCE for Folic Acid Determination"

Abid, K.; Zribi, R.; Maalej, R.; Foti, A.; Khaskhoussi, A.; Gucciardi, P. G.; Neri, G.
FlatChem 2022, 36, 100433. DOI: [10.1016/j.flatc.2022.100433](https://doi.org/10.1016/j.flatc.2022.100433).

◦ **August 2022:** Chapter "Properties of 2D materials " in Graphene and 2D Materials in Heat Transfer: Fundamentals and Applications

Abid, K.; Belkhir, N. H.; Wali, R.; Maalej, R

◦ **August 2020:** "Photoinduced Enhanced Raman Spectroscopy with Hybrid Au@WS2 Nanosheets"

Abid, K.; Belkhir, N. H.; Jaber, S. B.; Zribi, R.; Donato, M. G.; Di Marco, G.; Gucciardi, P. G.; Neri, G.; Maalej, R.

J. Phys. Chem. C 2020, 124 (37), 20350–20358. DOI: [10.1021/acs.jpcc.0c04664](https://doi.org/10.1021/acs.jpcc.0c04664)

CONFERENCES, WORKSHOPS AND SEMINARS

◦ **23-25 September 2024:** First Arab-German Plasmonic Sensor Workshop- Cairo-Egypt

Title: "Photo-induced enhanced Raman spectroscopy (PIERS) based on 2D materials"

Authors: **Khoulood Abid**¹, Antonino Foti¹, Pietro Giuseppe Gucciardi¹

Oral presentation.

Role: presenter

◦ **10-12 July 2024:** Plasmonica Workshop, Messina-Italy

Title: "Photo-Induced Enhanced Raman Spectroscopy Beyond Two-Dimensional Materials"

Authors: **Khoulood Abid**^{1,2,3*}, Nour H. Belkhir^{3,4}, Sultan B. Jaber⁵, Rayhane Zribi^{1,2}, Maria Grazia Donato¹, G. Di Marco¹, Antonino Foti¹, Pietro G. Gucciardi¹, Giovanni Neri, and Ramzi Maalej³

Oral presentation.

Role: presenter

◦ **25-28 June 2024:** Graphene 2024 conference, Madrid-Spain

Title: "PTwo-Dimensional Materials (2D) from Synthesis to High-Performance Electrochemical Sensors"

Authors: **Khoulood Abid**^{1,2}, Antonino Foti¹, Ramzi Maalej³, Pietro G. Gucciardi¹, and Giovanni Neri²

Oral presentation.

Role: presenter

◦ **3-7 June 2024:** The International School on Plasmonics and Nano-Optics. Lake-Como, Italy

Title: "Photo-Induced Raman Spectroscopy (PIERS) on AuNps-WS₂ Nanohybrid"

Authors: **Khoulood Abid**^{1,2,3*}, Nour H. Belkhir^{3,4}, Sultan B. Jaber⁵, Rayhane Zribi^{1,2}, Maria Grazia Donato¹, G. Di Marco¹, Antonino Foti¹, Pietro G. Gucciardi¹, Giovanni Neri, and Ramzi Maalej³

Oral presentation.

Role: presenter

◦ **29-30 May 2023:** 7th International Conference on Material Science and Engineering- Barcelona-Spain

Title: "Novel sensitive platform toward thiram pesticide based on GO:WS₂/SPCE"

Authors: **Khoulood Abid**^{1,2,3}, Daniela Iannazzo¹, Consuelo Celesti¹, Amani Khaskhoussi¹, Antonino Foti², Ramzi Maalej³, Pietro Giuseppe Gucciardi², Giovanni Neri^{1*}

Oral presentation.

Role: presenter

◦ **22-25 May 2022:** 7th International Conference on Bio-Sensing Technology- Sitges-Spain

Title: "A New Electrochemical Like-Immuno-sensor Based on Au@MoS₂ hybrid for The Detection of Vitamin B₉"

Authors: **Khoulood Abid**^{1,2,3*}, Ramzi Maalej¹, Antonino Foti³, Pietro G. Gucciardi³, Giovanni Neri²

Oral presentation

Role: presenter

- **10-11 February 2022:** RSC Chemical Nanoscience and Nanotechnology Early Careers Virtual Meeting - Online

Title: "PIERS Hybrid Au@WS₂ Nanosheets for Sensitive Detection of 4-Mercaptobenzoic Acid"

Authors: **K.Abid**¹, N.Hamza Belkhir⁺, R.Zribi^{3,4}, S.Jaber⁵, P.Gucciardi⁶, G.Neri^{3,4}, R.Maalej¹

Poster presentation

Role: presenter

- **10-11 February 2022:** AISEM - Online

Title: "New Electrochemical Platform Au@MoS₂ for Sensing Aim at Low Concentrations"

Authors: **Khoulood Abid**^{1,2,3,4}, Giovanni Neri^{2,3}, Pietro G. Gucciardi⁴, Ramzi Maâlej¹

Poster presentation

Role: presenter

- **4-7 February 2021:** AMEG - Online

Title: "New PIERS Substrate for The Detection at Low Traces Based on WS₂ Nanosheets and Gold Nanoparticles"

Authors: **K.Abid**^{1*}, N.Hamza Belkhir^{1,2}, R.Zribi^{1,3,4}, S.Jaber⁵, P.Gucciardi⁶, G.Neri^{3,4}, R.Maalej¹

Oral presentation

Role: presenter

- **07-09 December 2020 :** 6th Nano Boston Conference -Online

Title: "The efficiency of Photo-Induced Surface Enhanced Raman Spectroscopy (PIERS) WS₂-AuNPs sensor in the detection of MBA residues"

Authors: **Khoulood Abid**^{1*}, Nour H.Belkhir^{1,2}, Sultan B.Jaber^{3,4}, Rayhane Zribi^{1,5,6}, Pietro Gucciardi⁷, Giovanni Neri^{5,6}, Ramzi Maâlej¹

Poster presentation:

Role: presenter

- **29-31 October, 2019:** 4th International Conference of Engineering Sciences for Biology and Medicine (ESBM)

Title: "The SERS tool performance on MoS₂-AuNPs"

Authors: **K.Abid**¹, N.Hamza Belkhir^{1,2}, S.Jaber³, R.Zribi^{1,4}, P.Gucciardi⁴, G.Neri⁵, R.Maalej¹

Oral presentation:

Role: presenter

LECTURES

- Seminar at Department of Engineering of University of Messina-Italy.

Title: "Vitamin B9 Electrochemical Determination Based on MX₂-Au NPs"

Event name: Doctorate course (XXXV cycle)

Date: 5th May 2022

- Online teaching physics for high-school pupils on YouTube Channel Link:

https://www.youtube.com/watch?v=tBcZpnTdfx4&t=7s&ab_channel=NokhbaTN

OTHER ACTIVITIES

- Supervision of three students in 2021-2022 and 2022-2023

- **November 2022:** Editor member of American Journal of Chemical and Biochemical Engineering(AJCBE)

PERSONAL EXPERIENCES

2018-2019: Giving courses on mathematics and English for orphan kids in Sfax charity
Developing Website for my Family clothes brand

COMPETENCES

DIGITAL AND SOFTWARE COMPETENCES

Office365, Origin, Nova, DropView, VESTA, Chemdraw, ImageJ, LabSpec6, Gwydion, FPS, adobe photoshop. Average knowledge in html language, MATLAB and python

LANGUAGES

Arabic: Native language; **French:** B2 in speaking and B1 in writing; **English:** B2 B1 in speaking and B2 in writing; **Italian:** A2 in speaking and A1 in writing ; **Turkish:** A1 in speaking and A1 in writing.