



Mr. Jamil Khan

Passport: ZU4141311 | **Date of birth:** 23/12/1995 | **Place of birth:** Charsadda, Pakistan |

Nationality: Pakistani | **Gender:** Male | **Phone number:** (+92) 3169277262 (Mobile) |

Email address: kjamil738@yahoo.com | **WeChat:** +8618800431225 |

Address: P/O Office Serdheri Paloosa Tehsil & District Charsadda, Khyber Pakhtunkhwa, 24460, Pakistan (Home)

● ABOUT ME

I am a motivated PhD student with a strong foundation in both theoretical and experimental physics. Driven by curiosity about the fundamental laws of nature, I am eager to contribute to cutting-edge research and collaborate with experts. With a passion for solving complex problems, I aim to further develop my skills and contribute to the advancement of physics through innovative research.

● PROJECTS

02/10/2025 – CURRENT

Co-Doped NiO Nanostructures with Tunable Electronic Properties for Enhanced Photocatalytic Hydrogen Evolution and Asymmetric Supercapacitor Applications at the Materials Science Laboratory, Abdul Wali Khan University Mardan, Pakistan

Cobalt (Co)-doped nickel oxide (NiO) nanostructures were successfully synthesized via the co-precipitation method. X-ray diffraction (XRD) analysis confirmed the crystalline nature of the synthesized samples, with Co exhibiting a face-centered cubic (FCC) phase and NiO retaining a cubic crystal structure. Scanning electron microscopy (SEM) revealed that pristine NiO displayed a spherical morphology, while increasing Co doping induced a morphological transformation into nanoflower- and nanosheet-like architectures. Energy-dispersive X-ray spectroscopy (EDS) verified the uniform elemental distribution of Ni, Co, and O throughout the Co-doped NiO nanostructures.

UV-visible spectroscopy demonstrated a systematic reduction in the optical band gap from 3.2 eV for pure NiO to 2.6 eV upon Co incorporation. Photoluminescence (PL) spectroscopy results were consistent with photocurrent response and electrochemical impedance spectroscopy (EIS) measurements, indicating improved charge separation and reduced recombination of photogenerated charge carriers. Photocatalytic investigations revealed that Co-doped NiO samples (CN-1 and CN-2) exhibited significantly enhanced photocatalytic performance compared to pristine NiO. This improvement is attributed to Co-induced modulation of the electronic structure, which promotes efficient electron-hole separation and accelerates charge transport. Furthermore, the synergistic contribution of Co active sites facilitates rapid electron transfer, thereby enhancing the photocatalytic reduction process and overall hydrogen evolution efficiency.

Electrochemical performance evaluation showed that the CN-2 electrode delivered a maximum specific capacitance of 400 F g⁻¹ (derived from cyclic voltammetry at a scan rate of 10 mV s⁻¹) and 633 F g⁻¹ (obtained from galvanostatic charge-discharge measurements at a current density of 3 A g⁻¹). Additionally, the CN-2 electrode achieved a high energy density of 71.21 Wh kg⁻¹ and a power density of 1348 W kg⁻¹. These results demonstrate that increasing Co concentration in NiO nanostructures significantly enhances their electrochemical properties.

Overall, the findings highlight Co-doped NiO nanostructures as promising candidates for advanced photocatalytic hydrogen production and high-performance energy storage applications. **The research outcomes of this project are intended to be published in a well-reputed international peer-reviewed journal.**

10/11/2024 – 05/10/2025

I conducted experimental research on 'Enhancing Light Sensitivity and Detection Efficiency in Phthalocyanine (NiPc)-Based Visible Spectrum Photodetectors' at the Materials Science Laboratory, Abdul Wali Khan University Mardan, Pakistan.

This work explores nickel phthalocyanine (NiPc) as an active channel material for high-performance visible-light photodetectors. Comprehensive characterization using SEM, FTIR, and UV-visible spectroscopy confirmed the material's structural and optical suitability. The NiPc-based device exhibited an excellent on/off ratio of ~10⁷, hole mobility of 1.59 × 10⁻³ cm² V⁻¹ s⁻¹, photoresponsivity of 0.37 A W⁻¹, and a high specific detectivity of 1.7 × 10¹³ Jones. Fast response times of 205 ms (rise) and 696 ms (decay) were also achieved, attributed to strong light absorption and low dark current. These results demonstrate NiPc's strong potential for next-generation visible-spectrum photodetectors. **This work is currently under review in the *Journal of Optics* (Springer).**

12/12/2022 – 22/10/2024

I worked experimentally on Xenon Migration and Radiation Damage Recovery in Glassy Carbon Under Isochronal Annealing at National Center for Physics (NCP), Islamabad

This study investigates xenon (Xe) diffusion in glassy carbon and the evolution of ion-implantation-induced radiation damage upon annealing. Glassy carbon samples were implanted with Xe ions at room temperature using a dose of 2×10^{16} ions cm^{-2} and an energy of 320 keV, followed by isochronal annealing at temperatures ranging from 300 to 700 °C for 10 hours under vacuum. Post-implantation and annealing analyses were performed using Rutherford backscattering spectrometry (RBS) and Raman spectroscopy. Raman results revealed amorphization of the glassy carbon structure after room-temperature implantation, while implantations at elevated temperatures showed reduced radiation damage. Isochronal annealing led to significant recrystallization with increasing annealing temperature. **This work has been published in the international journal *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms* (Elsevier).**

22/09/2020 – 11/09/2022

I worked experimentally on “Radioactivity Measurement in Pakistan” in radiation physics lab at COMSATS university Islamabad under the supervision of Dr. Muhammad Hannan Younis and Dr. Gul Rooh.

The experiment focused on measuring the radioactivity levels in various samples across Pakistan using radiation detection equipment. Data was collected to assess environmental radiation exposure and identify areas with elevated radioactivity levels.

26/09/2018 – 26/09/2019

I worked experimentally on “Determination of Radiation Shielding Properties of EU2O3 Doped Silicate Glasses” at Abdul Wali Khan University Mardan, Pakistan

The experiment involved synthesizing EU_2O_3 doped silicate glasses and evaluating their radiation shielding properties. Various characterization techniques were employed to assess the shielding effectiveness and material stability under different radiation conditions.

● **PUBLICATIONS**

2026

[Modeling and Performance analysis of PM6:Y6 Based Inverted Bulk Heterojunction Organic Solar cells through SCAPS-1D Simulation](#)

Tania Shakeeb, Jamil Khan*, Aziz Sarmad, Salman Khan, Aftab Ahmad, Niamatullah*, Alamgir Khan, Khalilullah

Journal Name: Journal of Mathematics and Physics (JAMP) | **Volume, Issue and Pages:** Vol.14 No.1 | **Publisher:** Scientific Research

2025

[Xenon Migration and Radiation Damage Recovery in Glassy Carbon Under Isochronal Annealing](#)

Hannan Younis, Hira Khan, Jamil Khan, M.Y.A. Ismail, Nassir Saad Alarifi, Mostafa, R. Abukhadra, Muhammad Usman**

Authors: Hannan Younis, Hira Khan, Jamil Khan, M.Y.A. Ismail, Nassir Saad Alarifi, Mostafa R. Abukhadra, Muhammad Usman | **Journal Name:** Nuclear Instruments and Methods in Physics Research Section B: | **Volume, Issue and Pages:** Volume 569, December 2025, 165906 | **Publisher:** Elsevier

2025

[Spatial Distribution and Risk Profiling of Natural Radionuclides in Ravi River Sediment](#)

Authors: Mavia Anjum, Aleena Ishfaq, Jamil Khan, Sumbilah Shafique, Gwendolyn D. Bart, Muhammadhu Ameen Muhammadhu Azmin, Ansar Abbas, Hannan Younis* | **Journal Name:** Journal of Radiation Research and Applied Sciences | **Publisher:** Elsevier

2025

[Enhancing Light Sensitivity and Detection Efficiency in phthalocyanine \(NiPc\) based Visible Spectrum Photodetectors \(Under review\)](#)

Authors: Jamil Khan*, Awais Mughal | **Journal Name:** Journal of Optics | **Publisher:** Springer Link

2025

[Radiological Hazard Assessment of Primordial Radionuclide in Granite Samples \(Accepted will online Soon\)](#)

Authors: Jamil Khan, Muhammed Waseem, Hannan Younis*, Nassir Saad Alarifi, Mostafa R. Abukhadra, Mohammad Ayaz Ahmad, Shawn Jagnandan, Antalov Jagnandan, Muhammad Ajaz* | **Journal Name:** Scientific Reports

2025

[Investigation and Classification of Bone Fracture Using a Deep Learning Model](#)

Authors: Kamran Khan, Ayaz Ali, Abid Haider, Numan Ahmad Khan, Jamil Khan | **Journal Name:** Asian Journal of Science, Engineering and Technology (AJSET) | **Volume, Issue and Pages:** Vol. 4 No. 1 (2025): January-June 2025 | **Publisher:** IDEA Publishers

2026

[Theoretical Evaluation of Enhanced Gamma Radiation Shielding Properties of Eu₂O₃-Doped Silicate Glasses via WinXcom Simulations\(accepted Online very Soon\)](#)

Authors: Jamil Khan*, Salman Khan, Waqas Ahmad, Muhammad Zubair, Luqman Anwar | **Journal Name:** Journal of Modern Physics (JMP) | **Publisher:** Scientific Research

2024

[Study of Gamma Spectroscopy and Radiological Health Hazards of Primordial Radionuclides in Granite Samples of District Swabi, KP, Pakistan](#)

jamil Khan*, Ayaz Ali, Muhammed Waseem, Amar Shoukat

Journal Name: Natural and Applied Sciences International Journal (NASIJ) | **Publisher:** IDEA Publishers

2026

[A DFT Approached to Study the Structure, Electronic and Optical Properties of WSeX \(X =S,Te\) Chalcogenides \(Under Review\)](#)

Authors: Tania Shakeeb, Jamil Khan*, Hannan Younis*, Alamgir Khan, Khalilullah | **Journal Name:** Chinese Journal of Physics | **Publisher:** Elsevier

● EDUCATION AND TRAINING

26/09/2021 – 26/07/2025 Mardan, Khyber Pakhtunkhwa, Pakistan
MPHIL PHYSICS Abdul Wali Khan University

Material Science, Material Synthesis & Characterization, Radiation Detection & Measurements, Statistical Mechanics, Electrodynamics, Mathematical Methods for Physics.

Website <https://awkum.edu.pk/> | **Level in EQF** EQF level 7 |

Thesis Study of Radiological Hazard of Primordial Radionuclide in Granite Samples of District Dir, KPK, Pakistan

26/09/2015 – 26/09/2019 Mardan, Khyber Pakhtunkhwa, Pakistan
BS PHYSICS Abdul Wali Khan University

Mathematical and computational method in physics, Nano Science, High Energy Physics, Material Science, Particle Physics, statistical Physics, Advanced Quantum Mechanics, Fluid Mechanics, Nuclear Physics/Science, Waves and Oscillation, Optics, Heat and Thermodynamics, Physical Chemistry, Radiation Physics, Electricity and Magnetism, Electrodynamics, Lab of Electronics, Solid state Physics, Lab of Modern Physics, Lab of Nuclear Physics, Experimental Methods in Physics, Communication skills, Introduction to Programming, Geology.

Website <https://awkum.edu.pk/> | **Level in EQF** EQF level 6 |

Thesis Theoretical Investigation of Radiation Shielding Properties of Eu₂O₃ Doped Silicate Glasses

● ORGANISATIONAL SKILLS

Research Assistant at Radiation and materials Physics Lab, Department of Physics, Abdul Wali Khan University Mardan, Pakistan

As a Research Assistant at the Radiation and Materials Physics Lab, I contributed to experiments focused on radiation detection and material characterization such as Scanning Electron Microscopy (SEM), High-Resolution Scanning Transmission Electron Microscopy (HR-STEM), Energy Dispersive X-ray Spectroscopy (EDS), Photoluminescence (PL) Spectroscopy, UV-Visible Spectroscopy, Differential Scanning Calorimetry (DSC), Computational Techniques.

Lecturer & Lab supervisor at Sarhad University of Science & Information Technology, Mardan Campus, Pakistan

As a Lecturer & Lab Supervisor at Sarhad University of Science & Information Technology, Mardan Campus, I oversaw the design and execution of laboratory experiments, ensuring adherence to safety protocols and academic rigor. I guided students through hands-on experiments, facilitating their understanding of theoretical concepts while enhancing their practical skills in Physics and chemistry lab. Additionally, I provided support for the preparation of lab reports and analysis of experimental results.

Ex research assistant at National center for Physics (NCP), Islamabad, Pakistan

As a research assistant at the National Center for Physics (NCP), Islamabad, I worked on investigating Xenon migration and radiation damage recovery in glassy carbon materials under isochronal annealing conditions. The experiment focused on understanding how xenon ions interact with the glassy carbon matrix and the recovery mechanisms of radiation-induced damage upon controlled thermal treatment. Various analytical techniques, including Rutherford Backscattering Spectrometry (RBS) and Raman Spectroscopy, were used to evaluate the changes in material structure and properties.

Lecture & Lab supervisor at GEMS Group of School and Colleges, Mardan, Pakistan

As a Lecture & Lab Supervisor at GEMS Group of Schools and Colleges, Mardan, Pakistan, I was responsible for overseeing both theoretical and practical aspects of the curriculum. I guided students through experiments, ensuring they understood key scientific concepts while providing hands-on training in the laboratory. My role involved preparing experimental setups, supervising students, and ensuring a safe and effective learning environment.

Lecturer at ANSI degree College Mardan, Pakistan

As a Physics Lecturer at ANSI Degree College Mardan, Pakistan, I have had the opportunity to teach and mentor students, fostering a deep understanding of fundamental and advanced physics concepts. My role involves developing engaging lesson plans, conducting experiments, and guiding students towards academic excellence in a supportive learning environment. This experience has honed my skills in both teaching and scientific inquiry.

LABORATORY SKILLS

Experimental and Fabrication Techniques

- Fabrication of nanomaterial's Thin films, and Crystals Hydrothermal Method Co-precipitation Method
- Hydrothermal Method
- Co-precipitation Method
- Sol-Gell Method
- Lithography Physical Vapor Deposition (sputter deposition)

Characterization of nanomaterial's thin films and Crystals

- X-Ray diffraction analysis (XRD)
- Scanning Electron Microscopy (SEM)
- Energy Dispersive X-Ray analysis (EDX)
- Fourier Transforms Infrared Spectroscopy (FTIR)
- Ultraviolet-Visible Spectroscopy (UV-Vis)
- Photoluminescence, Thermoluminescence

CONFERENCES AND SEMINARS

2025

International School on Physics and Allied Disciplines (ISPAD-2025)

25/10/2021 – 27/10/2021 NCP Islamabad

Participation in the 4th International Workshop on Tracking Detectors in High Energy Physics (IWTD-HEP 2021)

09/03/2021 – 11/03/2021 NCP Islamabad

International School on Physics & Allied Disciplines (ISPAD)

Participation in the International Workshop on Nanomaterials for Energy Conversion and Emerging Photovoltaic and Optoelectronic Technologies (NEEPO-21)

SKILLS

Microsoft Office | Microsoft Excel | Origin8 | XCOM 2 | Python Language - Basic knowledge | Research Skills, | Organizational and planning skills | Decision-making | Data Science | Data Collection, Data Processing, Data Analysis, Data Visualisation | Analysis and observation (scientific work, conducted research)

HOBBIES AND INTERESTS

Reading

Passionate about reading books, especially in the fields of science, technology, and personal development. This hobby allows me to stay informed and continuously expand my knowledge.

Fitness and Sports

Engaged in regular physical activities such as running, basketball, and yoga. These hobbies help me maintain discipline, stay fit, and improve teamwork skills.

Traveling

Enjoy exploring new cultures and destinations, which enhances my adaptability, open-mindedness, and ability to connect with diverse groups of people.

Volunteering

Actively involved in community service, where I assist in organizing events and supporting social initiatives. Volunteering allows me to give back and develop leadership skills.

Photography

A keen photographer with a focus on nature and portrait photography. This interest helps me hone my attention to detail and creativity.

Gardening

Enjoy gardening, which allows me to cultivate patience and develop problem-solving skills in a hands-on, therapeutic way.

Cooking

Enjoy experimenting with new recipes and cooking techniques. This hobby nurtures creativity, attention to detail, and time management.

LANGUAGE SKILLS

Mother tongue(s): **PASHTO**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
URDU	B2	C2	C2	C2	C2
ENGLISH	C1	C1	C1	C1	C1
CHINESE	A1	A1	B1	A2	A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● RECOMMENDATIONS

Dr. Gul Rooh Supervisor

It is my pleasure to introduce Mr. Jamil Khan, whom I have known for the past seven years. He was a distinguished MPhil student in the Department of Physics at Abdul Wali Khan University Mardan, Pakistan, where I had the privilege of teaching him Quantum Mechanics during his coursework.

Mr. Jamil is an exceptionally diligent, dedicated, and intelligent individual. Throughout his time with us, he demonstrated active participation in academic activities and contributed meaningfully to class discussions. His enthusiasm and polite demeanor make him a pleasure to work with, and he possesses an adaptable nature, thriving in team environments with individuals from diverse backgrounds.

Additionally, Mr. Jamil is fluent in English, as it has been the medium of instruction throughout his academic journey, from school to university. If you need further information, please do not hesitate to write me and I will be happy to respond accordingly.

Sincerely,

Professor

Luminescent Materials Lab

Department of Physics, AWK University Mardan, Pakistan

Email gulrooh@awkum.edu.pk | **Phone** (+92) 3239240176

Dr. Hanna Younis Co-supervisor

I am Dr. Hannan Younis, Tenured Associate Professor of Physics at COMSATS University Islamabad. I have known Mr. Jamil Khan for the past four years as his teacher and research mentor. He has demonstrated exceptional academic performance and possesses strong motivation, goal-oriented mindset, and a keen interest in Material, Optical, and Radiation Physics, particularly in Medical Physics applications. His research is both promising and impactful.

Mr. Jamil Khan is an independent and highly capable student with excellent analytical skills, making him a valuable member of my research group. I strongly recommended him for higher education in your lab. If you need further information, please do not hesitate to write me and I will be happy to respond accordingly.

Sincerely,

Associate Professor

Radiation Physics Lab

Department of Physics, COMSATS University Islamabad, Pakistan

Email hannan.younis@comsats.edu.pk | **Phone** (+92) 3335495914