

الاهتمامات البحثية / الموضوعات البحثية المقترحة للدراسات العليا / قسم الفيزياء 2023-2024

الاهتمامات البحثية / الموضوعات البحثية المقترحة	اسم عضو هيئة التدريس
<ul style="list-style-type: none"> Investigating the anomalous large angle scattering effect for alpha scattering off light and intermediate nuclei Nonlocal effects in nucleon-nucleus scattering 	الاستاذ الدكتور محمود الجاغوب
<p>Synthesis and characterization of Luminescent materials. The graduate student is expected initially to prepare the material under investigation chemically in pure phase. Later the studied material should be prepared with dopants that will be selected from the rare earth ions. Characterization tools may include XRD, SEM, thermal analysis, and PL. Some experiments may require the use of the Jordanian Accelerator facilities (SESAME).</p>	الاستاذ الدكتور حسان الجوهرى
<ul style="list-style-type: none"> Nonlinear Physis Solions in optical fibres, waveguide arrays, and ocean waves Optical data processing Quantum computation Integrability and exact solutions Methods of solving nonlinear differential equations Bose-Einstein condensation 	الاستاذ الدكتور اسامه الخواجا
<ul style="list-style-type: none"> Dynamical processes of deep and coastal water circulation. Driven forces of waves, tides and shallow-water physical processes. Water masses characteristic, air-sea interaction, annual variation of heat flux and heat storage and its implications in climate change. Observation of physical properties of marine coastal ecosystem. 	الاستاذ الدكتور رياض مناصره
<ul style="list-style-type: none"> Nuclear Data Evaluation: This project aims to precise evaluate nuclear structure and decay data of the nuclear mass chains. Nuclear structure of heavy and super heavy ions: The project targets the actinide nuclei (Thorium, Uranium, Neptunium, Plutonium, Americium, Curium ...etc) in addition to the recently synthesized isotopes with $A > 250$. Steering of X-rays and nuclear radiation: The research focuses on using crystal diffraction technique for the steering and focusing of X-rays, g-rays and neutrons. In addition, applications of Synchrotron light in physics, cultural heritage and materials science are of major interest Reactor Physics and Applications 	الاستاذ الدكتور خليفه ابوسليم
High Energy Physics: Phenomenological Analysis. This includes QCD processes, Electroweak sector, and Higgs Boson sector.	الدكتور محمد جسين
<ul style="list-style-type: none"> Structural, electronic, vibrational and optical properties of materials using first principle methods which includes: Density Functional 	الدكتور رياض شلطف

<p>Theory, Density Functional Perturbation Theory and Many Body Perturbation Theory.</p> <ul style="list-style-type: none"> • Scientific coding • Machine learning methods in materials science • Molecular dynamics and Monte Carlo simulations 	
<ul style="list-style-type: none"> • Simulating and fabricating solar cells. • Design and analysis of surface acoustic waves sensors customized for the detection of volatile organic compounds. • Fabrication and characterization of self-assembled III-V compound semiconductor nanostructures (GaAs, InAs, InGaAs, AlGaAs). Structural, optical, and morphological studies of semiconductor quantum dots, rings, and wells. 	الدكتور زياد ابو وعر
<ul style="list-style-type: none"> • Determination of local atomic structure of disordered materials using synchrotron XRD and XAFS techniques. • Modeling and simulation of local atomic structures of disordered materials. • Effects of dielectric coating on field electron emission from nano-tips. • Radiation-induced polymerization in gel dosimeters for radiotherapy treatments. 	الدكتور منيب شطناوي
<ul style="list-style-type: none"> • Experimental Atomic and Molecular Physics (Accelerator-based) • Physics Education - Science Popularization • - History of Science 	الدكتورة حنان سعادة
<p>Accurate quantum mechanical treatments of the spectroscopy of small molecules, where the calculations provide extensive molecular line lists for exoplanets and other atmospheres. Other applications of the calculations are to studies of the interstellar medium, atmospheric physics and plasma physics.</p>	الدكتورة الاء عزام
<p>Scientific computing with applications to Atomic Physics Spectroscopy using several atomic computer programs in order for solving the ab-initio Non-relativistic and Relativistic Shrödinger Equation for atomic systems. From the wave-functions different properties such as energy structure, hyperfine structure, isotope shifts, transition rates, and splittings due to external magnetic fields can be determined.</p> <p>Solving the ab- initio Time Dependent Shrödinger Equation in application of ultrafast laser atom interactions, such as studying the non-linear response of atoms or ions in strong laser fields which leads to generate photons with ultrashort pulse duration, high brightness, and coherence called High Order Harmonics. High Order Harmonics is a unique source of XUV radiation used in several kind of laser systems.</p>	الدكتورة علا حسونه