

Kamal A. Al Saleh

Professor of Physics

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PERSONAL INFORMATION

- Work Address:** Department of Physics
The University of Jordan
Amman – JORDAN
- Qualification:** Ph.D. in Physics / 1984
Penn State University / USA
- Rank:** Professor of Physics
- Field of Specialty:** Experimental Condensed Matter Physics.
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kamals50@hotmail.com
- Birthday:** March 20, 1950
- Nationality:** Jordanian
- Marital Status:** Married, Five children



I started working at the University of Jordan at the Department of Physics since September 1984. Now I am a full Professor and holding a permanent position. I have served as a head of the department of Physics at the University of Jordan in the period (1997-1999). I have been on leave without pay and on Sabbatical leave at the United Arab Emirates University UAEU (1999-2003). Also, I have been on Sabbatical leave at The University of Applied Science /Amman/ Jordan (1993-1994).

I have the experience in teaching various Physics courses, undergraduate and some graduate courses, especially those of computer based courses. In particular, I have regularly and intensively taught Electronics course and its laboratory, Classical Mechanics, Introductory Physics I and II, and computational Physics and computer

packages. I am experienced in utilizing Web and multimedia teaching environment with computer as an assistant tool in teaching / learning of Physics applications and problem solving.

CAREER OBJECTIVES AND TEACHING PHILOSOPHY:

I am motivated to exploit my long teaching experience and utilize my administrative experience in developing and ensuring a suitable teaching methods and using computer-assisted teaching environment to enhance the learning / teaching process. I am challenged to be persistent and creative to contribute to the development of Physics teaching and serve the purpose of the high quality education.

It is my goal to combine my range of teaching experience with my ability to be a compassionate, enthusiastic, intelligent faculty teaching member and administrator who will make a positive contribution to any scientific institute, and to make positive contribution in teaching many different Physics courses and provide students with a high quality education in physics.

I have been teaching computational physics courses and training students on computational skills to reinforce analytical and numerical methods to do modeling, simulation, visualization and animation applied to various subjects of physics. In the past seven years I have been actively involved in developing and teaching the following computer based courses:

- "**Capstone course**"; undergraduate course at the United Arab Emirate University (1999 – 2003).
- "**Software Packages in Physics I**"; undergraduate course at the University of Jordan (2003 – up to Now).
- "**Software Packages in Physics II**"; undergraduate course at the University of Jordan (2003 – up to Now).
- "**Computational Physics**"; graduate course at the University of Jordan (2003 – up to Now).

As a reference of my computer work, I have prepared some preliminary examples on simulation and animation of some physical systems included in the form of executable

icons. The following are samples of some applications which I have accomplished using visual basic programming language to demonstrate the importance of simulation and visualization of physical systems (these icons cannot run in PDF copy of my CV, but can run only in Microsoft copy of my CV). [Double Click the mouse right button on the icon below](#) to run the demonstration and kindly trust the publisher then accept running the given files.



Simple Harmonic Oscillator Model



S. H. O. Virtual Experiment



Non-Linear Pendulum



Projectile Motion



Kinematic Laws of Motion



Double Pendulum

EDUCATION AND CREDENTIALS

Qualification	Name of Institution	Location of Institution	Year completed
Ph. D. / Physics	Penn state University	Pennsylvania / USA	1984.
M. Sc. / Physics	The University of Jordan	Amman / Jordan	1977
B. Sc. / Physics	The University of Jordan	Amman / Jordan	1973
High School Diploma	Al Husain College	Amman / Jordan	1969

CURRENT LINE OF RESEARCH

I have been involved in different areas of research activities related to elemental, structural, and electrical characterization of surfaces and interfaces in bulk and in thin film samples. My research activities are classified as follows:

1. Heavy ion beam irradiation and modification of bi-layer thin films or metal thin films on semiconductor, and the characterization of the resulting atomic diffusion (ion mixing) across the interface using Rutherford backscattering spectrometry (RBS), in conjunction with electrical resistivity measurements.
2. X-Ray Fluorescence Spectrometry (XRF) using x-ray tube and radioactive isotopes, to the analysis of industrial, food, agricultural and geological materials; In addition to the Measurements of the x-ray cross sections and other fundamental parameters using different single element standard samples.
3. Proton induced x-ray emission (PIXE) using ion beam accelerator, to do elemental analysis of different kind of samples, in addition to production cross section measurements using different single element standard samples.
4. Contributing to the construction of an X-Ray Scanning tomography system, and its application in medical and biological fields.
5. Recently I am involved in characterization of thin film parameters, using a new computerized (Film Tech) optical system based on optical reflection and refraction. This system combines fiber-optic spectro-photometry with advanced material modeling software and spectral density analysis to provide simultaneous measurement of film thickness, index of refraction, extinction coefficient, energy band gap, composition, crystallinity, and surface roughness of thin films.

It is my goal to develop research projects based on thin film applications, and willing to make positive contribution to any other related fields of research.

THESES TITLES AND FIELDS OF STUDY

Ph.D. : Construction of a New Atom - Probe Field Ion Microscope and its Application to Study of Solute Behavior in Dilute Iron Base Alloys.

M.Sc. : The Electro-Optical Properties of Lyophobic Colloid.

WORK HISTORY

Date Started	Date finished	Job title	Institute	Institute location/town
September/2003	Present	Professor of Physics	The University of Jordan	Amman/Jordan
September/1999	September/2003	Professor of Physics On Leave	United Arab Emirates University	Al Ain/United Arab Emirates
November/1998	September/1999	Professor of Physics	The University of Jordan	Amman/Jordan
September/1994	November/1998	Associate Professor of Physics	The University of Jordan	Amman/Jordan
September/1993	September/1994	Associate Professor of Physics On Sabbatical	The University of Applied Science.	Amman/Jordan
April/1989	September/1993	Associate Professor of Physics	The University of Jordan.	Amman/Jordan
September/1984	April/1989	Assistant Professor of Physics	The University of Jordan	Amman/Jordan
September/1979	September/1977	Full Time Lecturer	The University of Jordan	Amman/Jordan

AWARDS

- Pennsylvania State University Graduate Teaching /Research Assistantship (Sept. 1983 - Sept. 1984).
- The University of Jordan scholarship for Ph.D. study at Pennsylvania State University (Sept. 1979 - Sept. 1983).
- The University of Jordan, Graduate Teaching Assistantship (Sept. 1976 - June 1977).

CONFERENCES, TRAINING AND SCIENTIFIC VISITS

- Participation in a five weeks international training course on computer programming for x-ray analysis in Yugoslavia, organized by the international atomic energy agency; in 11 / 11-13 / 12 / 1985.
- Two weeks scientific visit to Hinemitener Institute of Technology / German institute to establish scientific cooperation; in 12-26 / 1 / 1989.
- Participating in the national organizing committee for the 45th international field emission symposium in Jordan 1998.
- Participation in the 30th International Field Emission Symposium, University of Pennsylvania, Philadelphia, August 1-5, 1983.
- Participation in the 1st. Workshop on Van de Graaff Accelerators in research, Training and Technological Applications (ARRTA, 85), Amman-Jordan, September 8-14, 1985.

- Participation in the First Conference on Physics of Condensed Matter, PCM, Amman- Jordan, October 28-31/10/1986.
- Participation in the 2nd. Workshop on Van de Graaff Accelerators in Research, Training and Technological Applications, Amman - Jordan, November 23-27/11/1987.
- Participating in the third conference on physics of condensed matter; at Applied Science University and at University of Jordan, Amman – Jordan, in 18-21/4/1994.
- Attending the International conference on computer and information systems; at Applied Science University, Amman-Jordan, in 30/7-1/8/1994.
- Participating in the third workshop on Van de Graaff Accelerators in research, training and technological applications, University of Jordan, Amman-Jordan, in 14-17/8/1995.

These in addition to many other local workshops and conferences.

PROFESSIONAL EXPERIENCE

Administration

- Chairing the physics department at the University of Jordan starting September 1997 up to September 1999.
- Supervising an international training course in using the Van de Graaff Accelerator for analysis of air particulate in cooperation with the international atomic energy agency, from Nov., 22 to Nov., 26-1997.

Academic and Scientific activities

- Teaching most of the physics courses in the physics department/University of Jordan, to freshman, undergraduate and graduate students. And in the past six years, I am teaching two new undergraduate courses at the University of Jordan: "Computer packages and applications in Physics I & II"; In addition to one new graduate course: "Computational Physics".
- Supervising research master theses for graduate students.
- During the time as a chairman of the physics department, I have been involved in developing and restructuring of the course description and course requirements for the B.Sc. Degree in physics.
- Participation in examining committee for a number of M.Sc. and Ph.D. theses, and participating in the preparation of comprehensive examination for M. Sc. and Ph. D. graduate students at the University of Jordan.
- Writing with another colleague a text book in "Waves and Vibrations" for the Jerusalem Open University.
- Refereeing number of scientific publications for local journals.
- Contributing to a number of research proposals, especially those supported by the international atomic energy agency (IAEA), which are related to x-ray fluorescence using x-ray tube and radio active sources, and those related to particle induces x-ray emission (PIXE). In addition to the participation in construction of x-ray and γ -ray computerized tomography scanner.

Scientific and Research Skills

- Designing mechanical parts for vacuum systems, and the mechanical parts for an x-ray scanner, in which three degrees of freedom sample holder is built and controlled by computer using three stepper motors.
- Writing computer programs to run three stepper motors to change the sample position and to control multi-channel analyzer used for x-ray data acquisition and for data storing.
- Construction of a computerized atom probe field ion microscope during my Ph.D. study in the United States. I have designed and built many mechanical vacuum parts needed for this system using the mechanical workshop and my personal skills in machining stainless steel vacuum parts.
- I have other computer skills using the available software for word processing, data analysis, spread sheets, “*Mathematica*” package, Visual Basic Language. I am utilizing the university electronic teaching media: “Blackboard”, which is available for the web base teaching courses. In addition, I use some computer packages needed for graphic representation and data fitting. I am using, also the computer for electronic mail and searching the internet for literature, books, education materials and many other information.
- Teaching the course and the related Lab. In Electronics for the undergraduate students. In which electronic devices and their applications in analogue and digital circuits are discussed.

PUBLICATIONS AND PROCEEDINGS

- (1) "PIXE FACILITY AT JORDAN VAN-DE GRAAFF ACCELERATOR", Naser Saleh, Awni Hallak, **Kamal Al-Saleh** and Dia-Eddin Arafah, Appl. Phys. Commun., 5 (1985-86) 253-262.
- (2) "COMBINED XRF AND PIXE ANALYSIS OF FLOUR", N.S. Saleh, and Kamal A. Al-Saleh, Appl. Phys. Commun., 6 (1986) 195-204.
- (3) "XRF INDUCED BY PIXE: COMPARISON WITH PIXE", Naser S. Saleh, **Kamal A. Al-Saleh**, J. Radioanal. & Nucl. Chem. Lett., 108 (1986) 363-373.
- (4) "NUCLEAR ANALYSIS OF JORDANIAN TOBACCO", **Kamal A. Al-Saleh**, and Naser S. Saleh, Nucl. Instrum. & Meth., B18 (1986) 77-79.
- (5) "MEASUREMENT OF K-SHELL X-RAY CROSS SECTIONS OF SELECTED ELEMENTS FROM Ti TO Zn FOR INCIDENT PROTONS", Naser S. Saleh and **Kamal A. Al-Saleh**, Phys. Stat. Sol. (a), 102 (1987) 619-623.
- (6) "A NEW APPROACH TO ABSORPTION EFFECTS USING RADIOISOTOPE X-RAY SPECTROMETRY", Naser S. Saleh, **Kamal A. Al-Saleh** and A. Abu El-Haija, J. Radioanal. & Nucl. Chem. Lett., 118 (1987) 177-184.
- (7) "QUANTITATIVE ANALYSIS OF STAINLESS STEEL USING NUCLEAR TECHNIQUES", A. J. Abu El-Haija, **Kamal A. Al-Saleh**, D. k E. Arafah, N. A. Halim, M. R. Kamal, J. M. Khalife, and N. S. Saleh, Mat. Sci. & Eng., 195 (1987) 267-271.

- (8) "COMBINED NUCLEAR MEASUREMENTS OF YEAST", N. S. Saleh, **Kamal A. Al-Saleh**, D. E. Arafah, and N.Halim, Nucl. Instrum. & Meth., B23 (1987) 379-381.
- (9) "XRF INDUCED BY PIXE: COMPARISON WITH RADIOISOTOPE XRF", **Kamal A. Al-Saleh**, J.D. Meyer, and N. S. Saleh, Appl. Phys., A42 (1987) 327-329.
- (10) "MEASUREMENT OF PHOTON INDUCED K- α AND K- β X-RAY FLUORESCENCE CROSS-SECTIONS FOR SOME ELEMENTS WITH $73 < Z < 82$ ", N. S. Saleh and **Kamal A. Al-Saleh**, Int. J. Appl. Radiat. & Isot., 38 (1987) 975-977.
- (11) "ASSESSMENT OF JORDANIAN SALT USING NUCLEAR TECHNIQUES", **Kamal A. Al-Saleh**, D. E. Arafah, I.J. Jabr, and N. S. Saleh, Appl. Phys. Commun., 7 (1987) 195-208.
- (12) "MEASUREMENT OF X-RAY ATTENUATION COEFFICIENTS FOR ELEMENTS IN THE RANGE $79 < Z < 92$ ", N. S. Saleh, M.A. Sharif and **Kamal A. Al-Saleh**, Appl. Phys. Commun., 7 (1987) 69-76.
- (13) "MEASUREMENT OF K CROSS SECTIONS AND FLUORESCENCE YIELDS FOR ELEMENTS IN THE RANGE $42 < Z < 57$ USING RADIOISOTOPE X-RAY FLUORESCENCE", I.A. Al-Nasr, I.J. Jabr, **Kamal A. Al-Saleh** and N.S. Saleh, Appl. Phys. A43 (1987) 71-73.
- (14) "ANALYSIS OF JORDANIAN PHOSPHATE USING NUCLEAR TECHNIQUES", N. S. saleh and **Kamal A. Al-Saleh**, Appl. Phys. Commun., 7 (1987) 313.
- (15) "STUDY OF ION BEAM INDUCED MIXING IN Sb/Si SYSTEM USING ELECTRICAL RESISTIVITY", A.J.Abu El-Haija, **Kamal A. Al-Saleh**, N.A.Halim, J.M.Khalifeh and N. S. Saleh, Appl. Phys. Commun., 7 (1987) 301.

- (16) "ENHANCEMENT EFFECTS IN XRF ANALYSIS", N.S. Saleh, **Kamal A. Al-Saleh** and A. J. AbuEl-Haija, J. Radioanal. & Nucl. Chem., 120 (1988) 161-165.
- (17) "STUDY OF ION BEAM INDUCED MIXING OF Sn/Si SYSTEM USING ELECTRICAL RESISTIVITY MEASUREMENTS", A. J. Abu El-Haija, **Kamal A. Al-Saleh**, N. A. Halim, J.M. Khalifeh, and N. S. Saleh, J. Radioanal. & Nucl. Chem., 120 (1988) 387-392.
- (18) "ION BEAM MIXING OF Te/Au: Metastable Phase Formation", I. J. Jabr, J. D. Meyer, **Kamal A. Al-Saleh**, and N. S. Saleh, Phys. stat. Sol. (a), 105 (1988) 177-181.
- (19) "ION BEAM INDUCED MIXING OF Cu/Au BILAYER THIN FILM (KINEMATICS AND FORMATION OF METASTABLE SOLID SOLUTIONS)", I. J. Jabr, **Kamal A. Al-Saleh**, and N. S. Saleh, Appl. Phys., A46 (1988) 13.
- (20) "ION BEAM INDUCED MIXING OF Cu/Si SYSTEM USING ELECTRICAL RESISTIVITY AND RBS MEASUREMENTS", A. J. Abu El-Haija, **Kamal A. Al-Saleh**, N. A. Halim, J.M. Khalifeh, and N. S. Saleh, Phy. Stat. Sol. (a), 107 (1988) 253-260.
- (21) "PHOTON-INDUCED L-SHELL X-RAY INTENSITY RATIO FOR ELEMENTS WITH $73 < Z < 83$ IN THE ENERGY RANGE $17 < E < 47$ keV", N. S. Saleh, **Kamal A. Al-Saleh**, A. J. Abu El-Haija, N. A. Halim, and J. M. Khalifeh, Int. J. Appl. Radiat. & Isot., 39 (1988) 1213-1217.
- (22) "A.C. CONDUCTIVITY OF JORDANIAN ROCK WOOL", A.J. Abu El-Haija, **Kamal A. Al-Saleh**, N. A. Halim, J. M. Khalifeh and N. S. Saleh, DIRASAT Nat. Sci., XV (9) (1989) 126.

- (23) "PHOTON - INDUCED K - SHELL X-RAY INTENSITY RATIO FOR ELEMENTS WITH $73 < Z < 92$ ", N. S. Saleh, M. A. Al-Sharif, **Kamal A. Al-Saleh** and I. J. Jabr, J. Radioanal. Nucl. Chem., 131 (1989) 35.
- (24) "COMPARISON OF ION BEAM INDUCED ATOMIC MIXING KINETICS OF Ti/Si, Fe/Si AND Ni/Si SYSTEMS", **Kamal A. Al-Saleh**, I.J. Jabr and N.S. Saleh, Phys. Stat. Sol., (a) 118 (1990)467-472.
- (25) "KINETICS OF ION-BEAM MIXING AT Ti - Si INTERFACES", I.J. Jabr, N.S. Saleh and **Kamal A. Al-Saleh**, J. Mat. Sci. Elect., 1 (1990) 100-104.
- (26) "KINETICS OF ION BEAM MIXING IN THE Au/Si SYSTEM", N.S. Saleh, **Kamal A. Al-Saleh** and A.M. Al-Saie, Phys. Stat. Sol., (a) 120 (1990) 169-173.
- (27) "ION BEAM MIXING OF NOBLE METALS - Ge BILAYER THIN FILMS", N.S. Saleh, **Kamal A. Al-Saleh** and A.A. Saleh, Nucl. Instrum. Meth., B47 (1990) 263-270.
- (28) "ION BEAM INDUCED ATOMIC MIXING KINETICS OF Te/Cu AND Te/Ag ", N.S. Saleh, I.J. Jabr and **Kamal A. Al-Saleh**, Nucl. Instrum. Meth., B71 (1992) 264-270.
- (29) " ION INDUCED ATOMIC TRANSPORT IN Pd/Ge SYSTEM" , **Kamal A. Al-Saleh** and N.S. Saleh, Nucl. Instrum & Methods, B 119 (1996) 395- 402.
- (30) "KINETICS OF ION BEAM MIXING OF THE Te/Se SYSTEM" , N. S. Saleh and **Kamal A. Al-Saleh**, Phys. Stat. Sol. (a) 157 (1996) 399-404.
- (31) "ION BEAM MIXING OF Au/In BILAYER THIN FILM : GROWTH OF INTERMIXED LAYER" , **Kamal A. Al-Saleh** and N. S. Saleh, Phys. Stat. Sol. (a) 161 (1997) 407-413.

- (32) "L X-RAY FLUORESCENCE CROSS SECTIONS OF HEAVY ELEMENTS EXCITED BY 16.04, 16.90, AND 17.78 keV PHOTONS", **Kamal A. Al-Saleh** and N. S. Saleh, Rad. Phys. & Chem. 54 (1999) 117 – 124.
- (33) " ION-INDUCED PHASE FORMATION IN Sb/Cu SYSTEM " , **Kamal A. Al-Saleh**, Il Nuovo Cimento, Vol. 20D, pp 1703-1714, November 1998.
- (34) "Description of an Emission –Transmission X Ray Computed Tomography Scanner System", Jamal Sharaf, **Kamal A. Al-Saleh**, Nasr S. Saleh, and Mohammad Shadermah, to be send for publication.