

DR. BASHAR LAHLOUH

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EDUCATION

- Ph.D. in Physics. Texas Tech University, Lubbock, Texas, U. S. A, 2000 – 2003.
- M.Sc. in physics. Texas Tech University. Lubbock, Texas, U. S. A, 1999 – 2000.
- Bachelor of Science in Physics. The University of Jordan, Amman – Jordan, 1991 – 1995.

RESEARCH EXPERIENCE

- **Played Major Role** in Founding Advanced Research Facility (Advanced Performance Materials Laboratory), Physics Department, Faculty of Science, The University of Jordan (2007 – Up to Date).
 - Operating Equipment in Lab:
 - Atomic Force Microscope (AFM).
 - Advanced Polarizing Microscope.
 - Advanced thin film analysis Tool (FilmTek).
 - Luminescence Spectrophotometer (UV-Vis PL).
 - Differential Scanning Calorimeter (DSC)
 - Spin Coater.
 - Various high temperature furnaces, vacuum ovens, hot stages, hot press, very sensitive balances, tools, etc.
 - SCT-1800 Physical Vapor Deposition system (PVD).
 - Shimadzu X-Ray Diffraction Machine (XRD).
 - Equipment Under Consideration to be added to the facility very soon:
 - Fourier Transform Infrared (FTIR).
 - Raman Spectroscopy.

Active research is currently being conducted in the above mentioned lab in various aspects of science including synthesis and characterization of various materials including: low-k materials, conductive polymers, CuInSe₂, CdSe, ZnS for solar-cell applications, luminescent materials.

- **Research Assistant.** Texas Tech University Lubbock, Texas, U.S.A. 1999 – 2003.
As a research assistant, the following was part of this job:

*Development of nanoporous low-k a-SiC/SiO₂/C:H films with dielectric constant as low as 2.1.

*Development of effective treatment methods for dielectric constant recovery of plasma damaged nanoporous low-k organosilicate films.

- *Design and construction of a supercritical carbon dioxide system for semiconductor applications.
- *Application of supercritical carbon dioxide for selective extraction of CO₂ soluble components to produce nanoporosity in organosilicate films.
- *Design and development of a flow-through and pulsed supercritical carbon dioxide system.
- *PECVD deposition of nanocrystalline SiC thin films.
 - *PECVD development and deposition of multiphase organosilicate films for nanoporous low-k application.
- *Design and implementation of MEMS micropumps, micro channels, waveguides and micro-moisture sensors.

ACADEMIC EXPERIENCE

- **Associate Professor in Physics**, The Physics Department, Faculty of Science, The University of Jordan, Amman, Jordan, September 17/12/2012- up to this date.
- **Assistant Professor in Physics**, The Physics Department, Faculty of Science, The University of Jordan, Amman, Jordan, September 2004 – 17/12/2012.
- **Assistant Professor in Physics**, The Prince Hussein Bin Abdullah II Academy of Civil Protection, Amman, Jordan, Fall 2009/2010.
- **Assistant Professor in Physics**, The Physics Department, Faculty of Science, The Applied Science University, Amman, Jordan, March 2004 - September 2004.
- **Teaching Assistant**, Texas Tech University. Lubbock, Texas, U. S. A, 1999 – 2001. Assignments included teaching Advanced Semiconductor Processing class in addition to introductory classes in Physics.

COURSES & TEACHING:

- Physics 101 and 102: general physics for science and engineering students.
- Physics 103 and 105: general physics for life sciences and medicine students.
- Modern physics for physics major students.
- Optics 1 for physics major students.
- Introduction to circuits for computer science students.
- Electronics for physics and materials science students.
- Electricity and magnetism for physics major students (both undergraduate and graduate levels)
- Semiconductor Physics for physics and materials science students.
- Special Topics for graduate students: spectroscopy.

ATTRIBUTES

- Self-motivated, enthusiastic, and accustomed to hard work and responsibility.
- Devoted, determined and have a great deal of energy to exert at work.
- Technically oriented with strong academic background.
- Adapt quickly to changing situations, while grasping and implementing new concepts.
- Team Leader and Player demonstrated ability to work well with people at all levels.

MASTER STUDENTS

- 1) Student Name: Bara'a Mahmoud Al-Khalayleh (supervisor)
Project Title: "Optical Properties Of Iodine Doped Poly(ethylene oxide)"

Graduated: Oct.2009
- 2) Student Name: Eman Salem Al-howeitat (supervisor)
Project Title: "Optical properties of copper indium diselenide (CuInSe₂) thin films prepared by physical vapor deposition method"
Graduated: Nov./2010
- 3) Student Name: Mohammad Khalil Al-Shahatit (co-supervisor)

Project Title: "Optical properties of metal doped titanium oxide films prepared by sol-gel spin coating technique"
Graduated: Dec.2010
- 4) Taqwa Jamal K. Aqel (supervisor)

Project Title: "Optical and Structural Properties of Undoped Cadmium Selenide Thin Films Deposited by Electron Beam Method".

Graduated: Sep. 2012

MEMBERSHIPS, COMMITTEES & REFEREEING

- Refereeing physics papers for local journals.
- **Blossom's Initiative for Blended Learning Team / Member**, Massachusetts Institute of Technology, Cambridge, MA, U.S.A, February 2008 – up to date.
- **Materials Science and Technology Program / Founding Committee / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman, Jordan.
- **Characterization Tools/Apparatus Committee / Member**, Faculty of Science, University of Jordan, Amman, Jordan, Academic Year 2008/2009.
- **Graduate Qualifying Exam Committee / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman – Jordan.
- **Undergraduate Qualifying Exam Committee / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman, Jordan.
- **Several Graduate Student Thesis Defense Committees / Supervisor / Co-supervisor / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman, Jordan

PUBLICATIONS & PRESENTATIONS

- “**Accumulation and Coarse Modes Aerosols Concentrations and Carbonaceous Contents in the Urban Background Atmosphere in Amman – Jordan**”. Hussein T, Juwhari H, Al Kuisi M, Alkattan H, **Lahlouh B**, Al-Hunaiti A. *Arabian Journal of Geosciences* 11, 617, 2018
- “**Purification and biochemical characterization of photo-active membrane protein bacteriorhodopsin from *Haloarcula marismortui*, an extreme halophile from the Dead Sea**”, Diya Alsafadi, Fawwaz I. Khalili, Hassan [Al-Jawhari Juwhari](#), Bashar Lahlouh, *International Journal of Biological Macromolecules*, 118 (B), 1942, 2018.
- “**Silicon Pyramid Structure as a Reflectivity Reduction Mechanism**” Ammar Mahmoud Al-Husseini and **Bashar Lahlouh**, *Journal of Applied Sciences*, 2017
- “**The γ -irradiation Effect on the Optical Properties of CdTe Thin Films Deposited by Thermal Evaporation Technique**” (Accepted Manuscript 2017)
- “**Room Temperature Photoluminescence of Spray-Deposited ZnO Thin Films on Glass Substrates**” S. Ikhmayis, H. Al-Jawhari, **B. Lahlouh** *ECRES 2016*.
- “**Magnetic properties and hyperfine interactions in M-type BaFe_{12-2x}Mo_xZn_xO₁₉ hexaferrites**” SH Mahmood, GH Dushaq, I Bsoul, M Awawdeh, HK Juwhari, **BI Lahlouh**, ...*Journal of Applied Mathematics and Physics* 2 (05), 77 (2014).
- “**Effects of Molybdenum Concentration and Valence State on the Structural and Magnetic Properties of BaFe_{11.6}Mo_xZn_{0.4-x}O₁₉ Hexaferrites**” Dushaq G. H. ; Mahmoud S. H. ; Bsoul I.; Juwhari H. K. ; **Lahlouh, B** ; AlDamen M. A. *ACTA METALLURGICA SINICA (ENGLISH LETTERS)* (2013) Volume: 26 Issue: 8 Pages: 509-516.
- “**AC electrical and optical characterization of epoxy-Al₂O₃ composites**” Al-Bayer, R ; Zihlif, A ; **Lahlouh, B** ; Elimat, Z ; Ragosta, G *JOURNAL OF MATERIALS SCIENCE-MATERIALS IN ELECTRONICS* (2013) Volume: 24 Issue: 8 Pages: 2866-2872.
- “**Annealing effects on the optical properties of europium-doped tin oxide thin films prepared by electron-beam evaporation**” Dirasat, *Pure Sciences*, Volume 39, No.1, 2013 **B. I. Lahlouh**, H. K. Juwhari, M. H. Kailani.
- “**Infrared photoluminescence of sol-gel spin-coated films of rare-earth activated lanthanum silicate**” *Materials Letters* 87 (2012), H.K. Juwhari, M.H. Kailani, **B.I. Lahlouh**, S.A. Abedrabbo, K.A. Saleh, W.B. White.
- “**Analytical study of thermal annealing behaviour of erbium emission in Er₂O₃-sol-gel silica films**” *Journal of Physics D: Applied Physics* 44 (2011), Abedrabbo, S., **Lahlouh, B.**, Fiory, A.T.
- “**Room-temperature silicon band-edge photoluminescence enhanced by spin-coated sol-gel films**” *Scripta Materialia*, Volume 65, Issue 9, November 2011, Pages 767-770 S. Abedrabbo, **B. Lahlouh**, S. Shet, A.T. Fiory
- “**Ellipsometric characterization of PbI₂ thin film on glass**” *Physica B* 404 (2009) A. Ahmad, S. Saq'an, **B. Lahlouh**, M. Hassan, A. Alsaad and H. El-Nasser.
- “**Hexamethyldisilazane vapor treatment of plasma damaged nanoporous methylsilsesquioxane films: Structural and electrical characteristics**” *Thin Solid Films*, 3399 – 3404, 516 (2008). T. Rajagopalan , **B. Lahlouh** , I. Chari a, M.T. Othman ,N. Biswas , D. Toma , S. Gangopadhyay.

- **“Low-k organosilicate films prepared betravinyltetramethylcyclotetrasiloxane,”** J. Lubguban, T. Rajagopalan, N. Metha, B. Lahlouh, J. Appl. Phys., 92 (2002),1033.
- **“Supercritical Carbon Dioxide Process for Forming Nanoporous Dielectrics,”** S. Gangopadhyay, J. Lubguban, T. Rajagopalan, B. Lahlouh, International Sematech/ Ultra low k workshop 2002.
- **“Investigation on hexamethyldisilazane vapor treatment of plasma-damaged nanoporous organosilicate films”** *Applied Surface Science*, 2006, vol. 252, no. 18, pp.6323 - 6331 T. Rajagopalan, **B. Lahlouh**, J.A. Lubguban, N. Biswas, S. Gangopadhyay, J. Sun, D.H. Huang, S.L. Simon, D. Toma and R. Butler.
- **“Supercritical CO₂ extraction of porogen phase: An alternative route to nanoporous dielectrics”**. Lubguban, J. A.; Gangopadhyay, S.; Lahlouh, B.; Rajagopalan, T.; Biswas, N.; Sun, J.; Huang, D. H.; Simon, S. L.; Mallikarjunan, A.; Kim, H.-C.; Hedstrom, J.; Volksen, W.; Miller, R. D.; Toney, M. F. *Journal of Materials Research* (2004).
- **“Ferrihydrite gels derived in the Fe(NO₃)₃□9H₂O-C₂H₅OH-CH₃CH₂O ternary system”**. Talantsev, Evgueni F.; Pantoya, Michelle L.; Camagong, Cristina; Lahlouh, Bashar; Nicolich, Steven M.; Gangopadhyay, Shubhra. *Journal of Non-Crystalline Solids* (2005).
- **“Post treatment of plasma-enhanced chemical vapor deposited a-SiC:H films for low-k dielectrics.”** B. Lahlouh, T. Rajagopalan, N. Biswas, J. Sun, D. Huang, S.L. Simon, J.A. Lubguban, Shubhra Gangopadhyay. *Thin Solid Films* 497 (1-2): 109-114 Feb, 21 2006.
- **“Silylation Using a Supercritical Carbon Dioxide Medium to Repair Plasma-Damaged Porous Organosilicate Films”** B. Lahlouh, J. A. Lubguban, G. Sivaraman, R. Gale, and S. Gangopadhyay *Electrochem. Solid-State Lett.* 7, G338 (2004).
- **“Use of SCCO₂ Processing for Integration and Formation of Ultra Low-k Dielectrics,”** D. Toma, M. Biberger, R. Butler, J. Sun, T. Rajagopalan, B. Lahlouh, International Sematech / Ultra low k workshop 2002.
- **“Novel Method for Producing Nanoporous Dielectric Films,”** B. Lahlouh, X. Wang, N. Metha, S. Gangopadhyay, MRS Fall meeting 2000. (Symposium L).
- **“Supercritical CO₂ Process for Porous Materials and Clean,”** B. Lahlouh, S. Gangopadhyay, SRC Center for Advance Interconnect Systems Technologies Review Meeting, RPI 2002.
- **“Supercritical carbon dioxide extraction to produce low-k plasma enhanced chemical vapor deposited dielectric films,”**J. A. Lubguban, J. Sun, T. Rajagopalan, B. Lahlouh. *Appl. Phys. Letters*, 81, 4407 (2002).
- **“Supercritical carbon dioxide extraction of porogens for the preparation of ltralow-dielectric-constant films”** Rajagopalan, T, Lahlouh, B, Lubguban, JA, et al. *APPL PHYS LETT* 82 (24): 4328-4330 JUN 16 2003.
- **“A two-stage discrete peristaltic micropump”** Berg, JM; Anderson, R; Anaya, M; Lahlouh, B; Holtz, M; Dallas, T *SENSOR ACTUAT A-PHYS* 104 (1): 6-10 MAR 15, 2003.
- **“Creating Nanoporosity By Selective Extraction Of Porogens Using Supercritical Carbon Dioxide/Cosolvent Processes”** B. Lahlouh, T. Rajagopalan, J. A. Lubguban et al. *MRS Spring Meeting 2003*, April 22-24 2003, San Francisco, CA.

HONORS & AWARDS

- Grants for Research & Development (\$80,000), Deanship for academic research, University of Jordan, Amman, Jordan, 2006 – up to date.
- Graduate Assistantship, Texas Tech University, TX, USA

ASSIGNMENTS & COMMITTEES

- **Blossom's Initiative for Blended Learning Team / Member**, Massachusetts Institute of Technology, Cambridge, MA, U.S.A, February 2008 – up to date.
- **Materials Science and Technology Program / Founding Committee / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman, Jordan.
- **Characterization Tools/Apparatus Committee / Member**, Faculty of Science, University of Jordan, Amman, Jordan, Academic Year 2008/2009.
- **Graduate Qualifying Exam Committee / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman – Jordan.
- **Undergraduate Qualifying Exam Committee / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman, Jordan.
- **Several Graduate Student Thesis Defense Committees / Supervisor / Co-supervisor / Member**, Department of Physics, Faculty of Science, University of Jordan, Amman, Jordan.

COMPUTER SKILLS

- Operating Systems: DOS and Windows..
- Program Packages: Microsoft Office 2010; Microcal Origin; Mathematica, Mathcad, Maple, and Multisem.

REFERENCES

- **Prof. Shubhra Gangopadhyay**
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