

Resume

Zeyad A. Alahmed, Ph.D

Education:

- **Ph.D Microelectronics-Photonics in May 2007, the University of Arkansas, Fayetteville, AR**
- **M.S. in Physics - Laser Spectroscopy - in May 2003, the University of Arkansas, Fayetteville, AR**
- **B. Ed. in Physics in Jun 1996, King Saud University in Riyadh, Saudi Arabia**

Skills and experiences:

- **Theoretical experiences:**
 - **Expert in First-principles calculation method with DFT.**
 - **Proficient in developing codes using Fortran.**
 - **Expert in CASTEP, Abinit, PWSCF, SAP, and OpenMX.**
 - **Expert in theoretical modeling of materials with nanostructures.**
 - **Capable of generating pseudopotentials using Troullier-Martins' method.**
 - **Capable of generating special k-points in BZ using Monkhorst-Pack's method.**
 - **Expert in Mathematica, Mathcad, Maple, Matlab, Jmol, CaRIne Crystallography, Gnuplot, and Origin.**
- **Experimental experiences:**

- **Expert in:**
 - **operation and alignment of different types of lasers**
 - **absorption characterization techniques**
 - **photoluminescence excitation spectroscopy (PLE)**
 - **designing glass sample cells**
 - **operation of vacuum systems**
 - **soldering**
- **Proficient in:**
 - **operating various signal-processing equipment**
 - **minor machining**
 - **designing electronic circuit**
- **Familiar with:**
 - **variety of optical equipments and components**
 - **Semiconductors nanostructures technology: optoelectronic applications, growth, Materials & Devices**
 - **growth by Molecular Beam Epitaxy (MBE) and MOCVD**
 - **characterization with Atomic Force Microscope (AFM)**
- **Computer skills:**
 - **Expert in most of the Unix, Linux and Windows operating systems.**
 - **Proficient in LaTeX, MS Office, MS Project, and others.**
- **Work experiences:**

- 2007-Current, Assistant Professor at the Department of Physics, King Saud Univ., Riyadh, KSA.
- 2004-2007, Research Assistant at the Department of Physics, UAF.
- 1997-2007, TA at the Department of Physics, King Saud Univ., Riyadh, KSA.
- 1996-1997, Physics Teacher at the Diplomatic Quarters High School in Riyadh, KSA.
- In the summer of 1996, the Saudi Arabian Standards Organization (SASO)
- Research experiences:
 - From fall 2001 to spring 2004, I studied photothermal deflection spectroscopy (PTDS) on Na and Rb atoms using two-photon absorption. My thesis develops a theory of two-photon PTDS. Also, we have developed a new detection technique for PTDS that has a significant improvement in the signal-to-noise ratio and in the frequency bandwidth compared with those available with current techniques.
 - My PhD dissertation concentrates on two projects. (a) Studying chemical potentials and formation energy of a vacancy in perovskite structure using first-principles calculation method. (b) Investigating effects of in-plane strains on structural, electronic, and electrical properties of ZnO using first-principles calculation.

Publications and Presentations:

1. Z. Al-Ahmed, Y. J. Li, and R. Gupta, Review of Scientific Instruments, 74, 349 (2003).
2. Z. Alahmed and R. Gupta, Appl. Phys. B 79, 741-479 (2004).
3. A. Sharma, G. Ycas, Z. Alahmed, and R. Gupta, "Detection of photothermal deflection signals with conjugate masks," Appl. Opt. 44, 3110-3116 (2005).

4. *Z. Alahmed* and H. Fu, “First-principles determination of chemical potentials and vacancy formation energy in lead titanate and barium titanate,” an extended abstract submitted to Fundamental Physics of Ferroelectrics Conference, 2006 in Williamsburg, Virginia.
5. *Z. Alahmed* and H. Fu, “First-principles determination of chemical potentials and vacancy formation energy in lead titanate and barium titanate,” a poster conference presented to Fundamental Physics of Ferroelectrics Conference, 2006 in Williamsburg, Virginia (poster).
6. *Z. Alahmed* and H. Fu, “Comparative study of vacancy formation energies in PbTiO₃ and BaTiO₃,” an extended abstract submitted to Fundamental Physics of Ferroelectrics Conference, 2007 in Williamsburg, Virginia.
7. *Z. Alahmed* and H. Fu, “Electronic structure and electromechanical properties in ZnO under inplane strain,” An abstract submitted to 14th Semiconducting and Insulating Conference, 2007 in Fayetteville, Arkansas.
8. *Z. Alahmed* and H. Fu, “First-principles determination of chemical potentials and vacancy formation energy in PbTiO₃ and BaTiO₃,” Physical Review B 76, 224101 (2007).
9. *Z. Alahmed* and H. Fu, “Polar semiconductor ZnO under inplane tensile strain,” Physical Review B 77, 045213 (2008) (Submitted on Aug 2, 2007 and Accepted on Dec 17, 2007, Published on Jan 31, 2008).
10. *Z. Alahmed* and H. Fu, “Electromechanical properties of ZnO under inplane tensile strain,” Physical Review B (To be submitted).

Academic Professional Membership and Awards:

Recipient of the First Microelectronics-Photonics Monthly Research Efficiency Award (2006).

Selected as a leader for Student Project Planning. University of Arkansas. August 06 to May 07.

Member of American Physical Society (APS).

Member of Optical Society of America (OSA).

Member of High Performance Computing (HPC- RedDiamond) at the University of Arkansas, from 2004.

Member of Laser and Spectroscopy research group in Physics Department, King Saud University, from 1999.

Member of e-learning committee in the college of Science from Feb 2008.

Member of the Strategic planning committee in the department of Physics and Astronomy, KSU, from Jan 2008.

Member of the plan study committee of the new B.Sc. Academic Program for department of Physics and astronomy, King Saud University, from May 1, 2008.