
Amal Elgawadi, PhD in Physicsaelgaw01@hotmail.com

Location: Cairo, Egypt

Mobiles: 0101-537-9377 & 0114-95-00-101

OBJECTIVE:

Required for accreditation. Experience in teaching and research in physics, spectroscopy, lasers, and photonics including in class and on-line teaching.

Education:

- **PhD in Photonics/Physics**, Oklahoma State University, USA.
Thesis: Effect of Strain on the Optical Properties of GaN Films, and GaN/AlGaN Heterostructure. Laser Lift-Off for GaN/AlGaN Multilayer.
 - **MS in Physics**, Al-Azahr University, Cairo, Egypt.
Thesis: Physical characterization of FeSn₂ thin films.
 - **MS in Electro-Physics**, Polytechnic Institute of New York University, USA.
 - **MS in Physics**, Polytechnic Institute of New York University, USA.
 - **BS in Physics**, Suez Canal University, Egypt.
-
-

TEACHING PROFESSIONAL EXPERIENCE:

High Institute for Engineering and Technology, Egypt**Literature**, October 2014 – current

-Taught General Physics (Classical Mechanics; Electricity and Magnetism) to preparatory year engineering students

-Taught wave and optics to communications and power engineering students

Zewail City of Science and Technology, 6 of October, Egypt**Adjunct faculty**, October 2015 – Jan 2016

-Taught spectroscopy for 3rd grade Nano Science and Material Science Students

King Saud University, Riyadh, KSA**Assistant Professor**, Jan 2010 – July 2010

-Taught Physics to preparatory year medical students

Oklahoma State University, Stillwater, OK**Teaching Assistant**, 2001

-Taught & supervised undergraduate students (optical/electrical experiments).

Polytechnic Institute of New York University, NY**Adjunct Faculty**, 1997 – 1999

-Taught and instructed undergraduate students (electromagnetic experiments).

COMPUTER SKILLS:**Hardware:** IBM PC, Macintosh**Operating Systems:** MS-DOS, Windows**Data Acquisition and Automation Software:** Lab View**Languages:** Q-Basic, True Basic**Multimedia:** Macromedia Authorware, Adobe Photoshop, Adobe Premiere**Image and Signal Processing:** MatLab (Intimate experience)**Software:** Origin, Microsoft Excel, Microsoft Word, Equation Editor, Microsoft PowerPoint, Google Spreadsheet, Form builder, and Google Form.**Instrument Interfaces:** GPIB and RS-232**Drafting:** AutoCAD (Intimate experience)**TECHINICAL SKILLS:**

Experience in machine shop equipment and operations (Lathe, Mill, etc.).

Workshop in refrigerator maintenance.

Photography, Photoshop and color developing.

PATENT:*Amal Elgawadi*, Fabrication of GaN and III-Nitride Alloys Freestanding Epilayers Membranes Using a Nonbonding Laser Lift-off Technique.

US Patent # 8313968 (Nov. 20, 2012)

World Patent Cooperation Treaty # WO/2009/026366.

Egypt Patent # 25851, Sep. 2012.

RESEARCH EXPERIENCE:**Current**

Editing research papers

Department of Physics**King Saud University****Assistant Professor** Jan 2010 – July 2010

Research on group III-nitrides.

Department of Electrical and Computer Engineering**Oklahoma State University****Research** 2006 – 2009

Research on group III-nitride.

Research Associate Jan 2007 – Dec 31, 2007**Photonics Specialist** Aug 2006 – Dec 2006**Center for Laser and Photonics Research & Department of Electrical and Computer Engineering****Oklahoma State University, Stillwater, OK****Research Assistant**, 2000 – 2005

- Fabricated freestanding nanoheterostructure membranes using nonbonding laser lift-off (NBLLO) technique.
- Separated GaN epilayers using laser lift-off (LLO) technique.
- Designed optical systems to determine the optical characterizations of semiconductors, such as Wide-band gap semiconductors (Al, Ga, P) III-nitrides and ZnO, grown for Light Emittted Diode (LED), Laser Diode (LD) and High Electron Mobility Transistors (HEMT) applications.
- Constructed, performed, and analyzed data from temperature dependent low-power-lasers experiments such as photoluminescence, reflectance, absorption, and photoabsorption.

- Built, achieved, and evaluated data from temperature dependent high-power-lasers experiments, such as, stimulated emission, and photoabsorption.
- Operated a wide variety of equipment such as *cw* and ultrafast laser spectroscopy (HeCd, Ar+, Nd:YAGs, Excimer), optoelectronics detection devices (CCD, PMT, photodiode), spectrometers, broadband optical sources and lock-in amplifiers.
- Determined optical properties of group III-nitride and ZnO bulk and thin films and GaN/AlGaIn heterostructure.
- Communicated with engineers and technicians during equipment troubleshooting.
- Set up work and purchase orders.

RESEREACH PROJECTS:

Doctoral Projects:

Center for Laser and Photonics Research, Oklahoma State University, Stillwater, OK

- Microelectronics Fabrication Lab: Fabricated THz microchips through a comprehensive lab course, including cleanrooms protocol, photolithography, etching, metal deposition, etc.
- Achieved terahertz time-domain spectroscopy (THz-TDS) measurements.
- Designed and tested a Q-switching laser.

Master's Research Projects:

Polytechnic Institute of New York University, NY

- Designed a virtual instrument using LabView to control the power of a laser diode and analyze the output of a microsphere-fiber optic coupler (Lab internship).
- Performed image and signal processing simulation experiments using MatLab.
- Developed an interactive multimedia program using Authorware.
- Assisted in building an Ultra High Vacuum Scanning Tunneling Microscope (UHV-STM).
- Performed computational methods and computer simulation analysis.

Additional Research Projects and Experience:

- Designed Ellipsometer and determined the optical constants for FeSn₂ thin films.
- Electrical: Measurements of V-I for *CdSSe/CdTe* solar cells. Analysis of data from Capacitance - Voltage (C-V) and Hall mobility measurements.
- Determined optical constants of lead glass.
- Completed a scanning electron microscope SEM course and lab (theory and lab).
- Attended transmission electron microscope TEM course and lab (unofficial audit).
- Thin films structure and characterization: X-Ray Diffraction (XRD).
- Pictured the topography of mica film and determined its thickness via interference fringes.

PROFESSIONAL MEMBERSHIPS:

American Physical Society

Optical Society of America

SPIE (The International Society for Optical Engineering)

AWARDS:

Lynn T Miller Scholarship, 2004-2005

Oklahoma State University, Electrical Engineering Fellowship, 2002-2004

Oklahoma State University, Arts and Sciences Fellowship, 2000-2002

LEADERSHIP & PERSONAL:

Leading a team of teaching assistants both in physics labs and tutorial sessions. Guided graduate students. Directed and supervised technicians. Proposal writing, presentation, and communication skills. Goal-oriented, team player, self-motivated, independent worker. Organizational and documentation skills. *Fluency in English (teaching 99% of the topics in English in Egypt and the Kingdom of Saudi Arabia).*

PUBLICATIONS:

1. **Amal Elgawadi**, Gordon Gainer, and Jerzy Krasinski, "The convergence of longitudinal excitons onto the Γ_5 transverse exciton in GaN and the thermal activation energy of longitudinal excitons," *J. Phys.: Condens. Matter* **25**, 335803 (2013).
2. **Amal Elgawadi**, and J. Krasinski, "Strain at the Surface of GaN Epilayers and at GaN/Sapphire Interface before and after Laser Lift-off (LLO) from the Sapphire Substrate," *J. Appl. Phys.*, **103**, 033519 (2008).
3. **Amal Elgawadi**, J. Krasinski, G. Gainer, Alexander Usikov, and V. Dmitriev, "Modification of the anomalous optical transitions in multilayer AlGa_N-based nanoheterostructure using a nonbonding laser lift-off technique," *J. Appl. Phys.*, **103**, 123512 (2008).
4. **Amal Elgawadi**, J. Krasinski, G. Gainer, and V. Dmitriev, "Modification of the Anomalous "V-shaped" and "S-shaped" Temperature Dependent Photon Energy in Al_xGa_{1-x}N/GaN (0 < x ≤ 38) Nanoheterostructures Using a Nonbonding Laser Lift off (NBLLO) Technique," *Proc. SPIE* 6894, 689421 (2008).
5. Zhen Jiang, Guan Xu, **Amal Elgawadi**, and Daqing Piao, "Development of a Trans-Rectal Optical Tomography Probe for Concurrent Sagittal Imaging with Trans-Rectal Ultrasound," Optical Society of America, Biomedical Optics, Instrumentation and Techniques for Tissue Imaging (BWG) (2008).
6. J. B. Lam, G. H. Gainer, S. Bidnyk, **Amal Elgawadi**, G. H. Park, J. Krasinski, J. J. Song, D. V. Tsvetkov, and V. A. Dmitriev, "Comparative study of HVPE- and MOCVD-grown nitride structures for UV lasing application," *Int. J. Nitride Semicond.* (2001).
7. J. B. Lam, G. H. Gainer, S. Bidnyk, **Amal Elgawadi**, G. H. Park, J. Krasinski, J. J. Song, D. V. Tsvetkov, and V. A. Dmitriev, "Comparative study of HVPE- and MOCVD-grown nitride structures for UV lasing application," *Mat. Res. Soc. Symp. Proc.*, G6.4 (2000).

Manuscripts or in preparation:

1. **Amal Elgawadi** et al., "Variations of crystal and surface lattice parameters of as-grown and FS GaN."
2. **Amal Elgawadi** et al., "Investigation of Debye temperatures of GaN."
3. **Amal Elgawadi** et al., "Fabrication of Freestanding AlGa_N Nanoheterostructure Membrane by Nonbonding Laser Lift-off (NBLLO) Technique."
4. **Amal Elgawadi** et al., "C-V and PL Investigations of the Effects of the Piezoelectric Field and the Strain on the Electron Mobility in Al_{0.22}Ga_{0.78}N/GaN Heterostructure Grown for High Electron Mobility Transitions (HEMTs) Applications."
5. **Amal Elgawadi** et al., "Strong Two Components Longitudinal Phonon (LO) -Replicas in GaN/AlGa_N Heterostructure."
6. **Amal Elgawadi** et al., "Nonradiative Recombination Effects on the Deep Ultra Violet emission in AlGa_N/Ga_N Heterostructure."
7. **Amal Elgawadi** et al., "Transmission and reflection of AlGa_N epilayers."
8. **Amal Elgawadi** et al., "Investigation of the photoquenching in ZnO by means of photoluminescence and photoabsorption techniques."