Mohammad Nazari, PhD
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Status

- Visiting Scholar, Texas State University (6/2013-Present)

Education

- Ph.D. in Physics, 1/2009-8/2013, GPA: 3.95/4.00
  - Texas Tech University (TTU), Lubbock TX, 79409
    Dissertation: "Vibrational and Optical Properties of Vanadium Dioxide"
- M.S. in Applied Physics, 9/2002-8/2005, GPA: 3.30/4.00
  - Sharif University of Technology, Tehran, Iran
    Thesis: "Effect of Bias Voltage on Properties of Diamond-Like Carbon"
- B.S. in Applied Physics, 9/1997-8/2002, GPA: 3.00/4.00
  - Tabriz University, Tabriz, Iran

Skills

- **Process Tools:** Focus Ion-Beam, Hot-Filament CVD, PECVD, Photolithography, Plate Cleaner/Asher, PVD (Sputtering and E-Beam Evaporation), Rapid Thermal Annealing, and Wire-Bonder
- **Analysis Tools**
  - **Material Analysis:** AFM, Ellipsometry, FTIR, Hall/IV/CV Electrical Measurements, micro-Raman, Photoluminescence (PL), Profilometer/Optical Profiler, SEM, TEM, UV/Vis, XPS, and familiar with XRD, and Time Resolved PL
  - **Simulation, Automation, and Data Analysis:** COMSOL, MATLAB, OriginLab, Peakfit, and LabVIEW

Experience Summary

- Self-driven, hardworking individual, independent thinker with leadership skills
- Semiconductor processing, device fabrication and characterization
- Experience in carrying out different optical, structural, and electrical characterization
- Experience in measurement and data analysis automation
- Management, leadership, and problem-solving skills
  - Hands on setting up, designing, building, and troubleshooting of research lab instruments
  - Supervising students at various levels of physics and engineering programs
  - Setting up optical characterization research Lab (6/2013-9/2013)
  - Consultant to lab equipment manufacturer (9/2005 –8/2007)
  - Educational lab management experience (9/2005–8/2007)
- Academic achievements
  - Invited speaker at the physics colloquium, physics department at Texas State University
  - Covered "Raman technique" part of "Material Characterization" class offered by professor Theodoropoulou
  - Years of experience in interpreting data, writing report and peer review journal papers, and presenting data
  - More than 12 peer review publications and 15 conference presentations (APS, MRS, TMS, IEEE *etc*.)
  - Reviewer for peer review journal papers: Material Research Society, Editor, IEEE Electron Device Letters Optics Communications)
  - More than 5 years of teaching experience at different levels of physics program
  - Years of experience in mentoring/supervising student at different level

Professional Summary

Visiting Scholar, Texas State University **6/2013-Present**

- Thermal management in power electronics
  - Temperature profile measurement in GaN-based heterostructure field effect transistor
  - Quality check and built-in stress investigation in device quality GaN grown on diamond (a DARPA project, cooperating with different groups including Navy Research Laboratory, and Element Six)
  - Lateral thermal conductivity measurement of CVD diamond thin films to be integrated into power electronics as a heat spreader
- Hot-filament CVD diamond installation, and diamond growth, optimization and characterization
- Remote temperature sensing inside an MBE chamber using Raman technique
- Feasibility study of 2-dimensional materials as local and stress-free sensing systems
- Raman characterization and analysis of energy storage materials (Applied Materials)
- Setting up optical characterization research lab with help of student and staffs
- Mentoring, supervising, and training PhD/master/undergraduate/high-school students

Teaching/Research Assistant (PhD Student), Texas Tech University **1/2009-6/2013**

- Comprehensive metal-to-insulator phase transition (MIT) study in VO_2 using micro-Raman, PL, XPS, AFM, and SEM
- Finite size, substrate, and native doping effects on properties of VO_2

Studying thickness change in VO_2 as a function of temperature

Research Assistant, Sharif University of Technology **9/2005–8/2007**

- Management of *"modern physics"* lab in Physics department at Sharif University of Technology with experience on repairing tools, modifying, adding, and writing manuals for measurements
- Mentoring and supervising a group of students to start their projects

Teaching/Research Assistant (M.S Student), Sharif University of Technology **9/2002–8/2005**

- Investigating properties (growth and characterization) of HFCVD grown diamond like carbon (DLC) films using FTIR and XPS analysis
- Contribution in developing novel techniques in carbon nanotube (CNT) fabrication
- Consultant to Lab equipment manufacturing company
- Teaching different level undergraduate labs

Publications and Presentations

1- "Chemical vapor deposition of diamond on GaN using MOCVD grown in-situ SiNx as dielectric adhesion layer", Siddique *et al*., ready for submission to journal of Applied Material and Interfaces
2- "Near-Ultraviolet Raman and Micro-Raman for Analysis of Electronic Materials", M. Nazari *et al.*, accepted for publication in Appl. Phys. Rev.
3- "Ultraviolet micro-Raman stress map of polycrystalline diamond grown selectively on silicon substrates using chemical vapor deposition", Ahmed *et al.*, Appl. Phys. Lett. **112**, 181907 (2018)
4- "Optical characterization and thermal properties of CVD diamond films for integration with power electronics", M. Nazari *et al.*, Solid State Electronics **136**, 12 (2017)
5- "Hexagonal boron nitride particles for determining the thermal conductivity of diamond films based on near-ultraviolet micro-Raman mapping", B. Squires, *et al.*, J. Phys. D: Appl. Phys. **50**, 24LT01 (2017)
6- "Ultraviolet and visible micro-Raman and micro-photoluminescence spectroscopy investigation of stress on a 75-mm GaN-on-diamond wafer", B.L. Hancock, *et al.*, Phys. Status Solidi C, 1600247 (2017)
7- "Ultraviolet Micro-Raman Spectroscopy Stress Mapping of a 75-mm GaN-on-Diamond Wafer", B. L. Hancock, *et al.*, Appl. Phys. Lett. **108**, 211901 (2016)
8- "Near-ultraviolet micro-Raman study of diamond grown on GaN", M. Nazari, *et al.*, App. Phys. Lett. **108**, 031901 (2016)
9- "Self-heating profile in an AlGaN/GaN high electron mobility transistor studied by ultraviolet and visible micro-Raman spectroscopy", M. Nazari, *et al.*, IEEE Trans. Electron Devices **62**, 1467 (2015)
10- "Current-induced formation of stable M_2-phase vanadium dioxide", M. Nazari, *et al.*, J. Phys. D: Appl. Phys. **48**, 135101 (2015)
11- "Raman measurements of substrate temperature in a molecular beam epitaxy growth chamber", T. Hutchins, *et al.*, Rev. Sci. Instrum. **86**, 014904 (2015)
12- "Effect of Tb^{3+} on the optical and vibrational properties of YBO_3 tri-doped with Eu^{3+}, Ce^{3+} and Tb^{3+}", S. Sohal, *et al.*, J. Appl. Phys. **115**, 183505 (2014)
13- "Finite size effect on the phase transition of vanadium dioxide", M. Nazari, *et al.*, Appl. Phys. Lett.**103**, 043108 (2013)
14- "Temperature dependence of the optical properties of VO_2 deposited on sapphire with different orientation", M. Nazari, *et al.*, Phys. Rev. B **87**, 035142 (2013)
15- "Structural, electrical, and terahertz transmission properties of VO_2 thin films grown on *c*-, *r*-, and *m*-plane sapphire substrates", Y. Zhao, *et al.*, J. Appl. Phys. **111**, 053533 (2012)
16- "Effect of free-carrier concentration on the phase transition and vibrational properties of VO_2", M. Nazari, *et al.*, Appl. Phys. Lett. **99**, 071902 (2011)
17- More than 15 conference presentations (APS, MRS, TMS, IEEE etc.)
18- Invited speaker in physics colloquium of physics department at Texas State University
19- Covered "Raman technique" part of "Material Characterization" class offered by professor Theodoropoulou

Association, Membership, Award and Honors

- Outstanding doctorate student award, TTU, Department of Physics, Spring 2013
- The Bucy Graduate Scholarships, TTU, Department of Physics, Fall 2011 and 2012
- The physics honor society, Sigma-Pi-Sigma
- American Physical Society

Professional Reference

- Mark Holtz, professor at Texas State University: mark.holtz@txstate.edu
- Edwin Piner, professor at Texas State University: epiner@txstate.edu
- Ayrton Bernussi, associate professor at TTU: ayrton.bernussi@ttu.edu
- Zhaoyang Fan, associate professor at TTU: zhaoyang.fan@ttu.edu