



**Dr. Jamal A Talla**  
**Associate professor**  
**Department of Physics,**  
**College of Science,**  
**Al-Albays University**  
**Email: [jtalla@aabu.edu.jo](mailto:jtalla@aabu.edu.jo)**  
**Phone: 00962-799015232**

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### **Research Interests**

- 1- Sensors modeling and fabrication.
- 2- Ab initio calculations
- 3- Simulations of X-ray diffractions
- 4- Device fabrication..
- 5- Flexible organic solar cells.
- 6- Nanotubes/Polymer composites.
- 7- Field emission.
- 8- Nanotube growth.

### **Education**

#### **PhD, Physics (specializing in nanophysics)**

Department of Physics, New Mexico State University, USA, May 2007

Thesis: "Spectroscopic and electronic study of carbon nanotubes and Carbon nanotubes composites"

#### **1. MS, major: Physics (specializing in nanophysics)- May 2005**

Department of Physics, New Mexico State University, USA

#### **2. BS, Physics: Department of Physics, Yarmouk University, Irbid, Jordan, June 1997**

### **Research Assistant**

August 2003 - 2007

Nanophysics Laboratory, Physics Department, New Mexico State University, USA

1. Device fabrication, flexible solar cells and organic field effect transistors
2. Studied the optical, thermal, conductive and photoelectric properties of carbon nanotubes/composites
3. Sensors fabrication

### **Teaching Experience**

1. Associate professor, Al Albays University, Mafraq, Jordan, 2015-present
2. Associate professor, King Faisal University, Al-Hasa, KSA, 2009-2015
3. Faculty Instructor, Al Albays University, Mafraq, Jordan, 2008-2009
4. Faculty instructor, Department of Physics, University of Houston, Houston, TX, 2007-2008
5. Teaching assistant, Department of Physics, New Mexico State University, Las Cruces, NM, 2003-2007.

### **Teaching courses**

- 1- General Physics I
- 2- General Physics II
- 3- Mathematical Physics I
- 4- Mathematical Physics II
- 5- Thermodynamics
- 6- Waves and vibrations

- 7- Quantum mechanics I    8- Quantum mechanics II  
9- Electromagnetism I    10- Electromagnetism II  
11- Solid state physics    12- Research and teaching methods (master course)

### **Visiting Scholar**

*Center for Nanotechnology and Molecular Materials, Wake Forest University, NC, USA*

1. *Developed methods for organic field effect transistors*
2. *Materials Examination using STM*
3. *Fabricate flexile organic solar cells*

### **Patents**

*[1] ANTENNAS BASED ON A CONDUCTIVE POLYMER COMPOSITE AND METHODS FOR PRODUCTION THEREOF. (WO/2010/011416) CURRAN, Seamus, TALLA, Jamal; DIAS, Sampath.*

### **Finished Funded projects**

- 1- *Effect of boron and nitrogen co-doping on CNT's electrical properties: Density functional theory. The Scientific Research Deanship at Al al-Bayt University (#139/2016)-2015 (20,400 JOD).*
- 2- *Ab initio Calculations of Doped Carbon Nanotubes Sensors. KACST project # (11-NAN1817-06), 2013 (724,000 SAR).*
- 3- *Solar Photocatalysis based on TiO<sub>2</sub> films for Sea Water Purification. KACST project # (10-NAN1142-06), 2013 (2,000,000 SAR).*

### **Administrative work**

*Member of Quality and Academic Accreditation at King Faisal University, 2009-2015.*

### **Master Thesis Supervision**

- 1- *Mohammed Shhadeh Alghashmari: "Effect of Stone Wales defects on electrical properties of carbon nanotubes: Density functional theory". Dec- 2018*
- 2- *Arwa Farouq Alsalieby: "Effect of Tensile Strength on Electrical Properties of Co-Doped Carbon Nanotubes with Boron and Nitrogen Atoms: Density Functional Theory". July-2018*
- 3- *Nibal Ghassan Abu Qamar: "Effect of stone Wales defects on electrical properties of small diameter single walled carbon nanotubes: density functional theory". June-2018.*
- 4- *Abdelrahman Gozlan: "Co-doping carbon nanotubes for toxic gas sensors applications: Ab initio simulations". June-2016*
- 5- *Ameera Mahmoud Khamees: "Influence of Stone Defects on the electronic properties of carbon nanotubes subjected to tensile strength: simulation study".Feb-2020*

6- Anaam Naif Al-Shraa: "Electrical properties of defected boron- nitride nanotube with different orientations of stone Wales defected: First principle calculation". Feb-2020

### **Publications**

- [1] R. Omari, E. Almahmoud, **J.A. Talla**, K. Al-Khaza'leh, A. Ghozlan, A. Al-Diabat, Influence of substitutional doping on the electronic properties of carbon nanotubes with Stone Wales defects: density functional calculations, *Fullerenes, Nanotubes and Carbon Nanostructures*, 28 (2020) 1-13.
- [2] K. Al-Khaza'leh, E.A. Almahmoud, **J.A. Talla**, Glucose/Fe-doped C70 fullerene hybrid biosensor: theoretical study, *Fullerenes, Nanotubes and Carbon Nanostructures*, 28 (2020) 1-8.
- [3] **J.A. Talla**, Band Gap Opening of Doped Graphene Stone Wales Defects: Simulation Study, *Semiconductors*, 54 (2020) 40-45.
- [4] M. Serhan, M. Abusini, E. Almahmoud, R. Omari, K. Al-Khaza'leh, H. Abu-Farsakh, A. Ghozlan, **J. Talla**, The electronic properties of different chiralities of defected boron nitride nanotubes: Theoretical study, *Computational Condensed Matter*, 22 (2020) e00439.
- [5] E.A. Almahmoud, **J.A. Talla**, H. Abu-Farsakh, Electronic properties of defective boron nitride mono-sheets under the influence of an external electric field, *Semiconductor Science and Technology*, 35 (2020) 025014.
- [6] **J.A. Talla**, Electronic properties of doped wurtzite ZnO: density functional theory, *Ukrainian Journal of Physics*, in press.
- [7] **J.A. Talla**, Pressure induced phase transition and band gap controlling in defective graphene mono-sheet: Density functional theory, *Materials Research Express*, 6 (2019) 115012.
- [8] M. Nairata, **J. Talla**, Electronic Properties of Aluminum Doped Carbon Nanotubes with Stone Wales Defects: Density Functional Theory, *Physics of the Solid State*, 61 (2019) 1896-1903.
- [9] E. Almahmoud, **J.A. Talla**, Band gap tuning in carbon doped boron nitride mono sheet with Stone-Wales defect: a simulation study, *Materials Research Express*, 6 (2019) 105038.
- [10] A.A. Ghozlan, **J.A. Talla**, OPTICAL PROPERTIES OF DEFECTIVE SILICON CARBIDE NANOTUBES: THEORETICAL STUDY, *Rev. Cubana Fis.*, 36 (2019) 27-36.
- [11] **J.A. Talla**, Band gap tuning of defective silicon carbide nanotubes under external electric field: Density functional theory, *Physics Letters A*, 383 (2019) 2076-2081.
- [12] **J.A. Talla**, A.F. Alsaliemy, Effect of uniaxial tensile strength on the electrical properties of doped carbon nanotubes: Density functional theory, *Chinese Journal of Physics*, 59 (2019) 418-425.
- [13] **J.A. Talla**, Electronic properties of silicon carbide nanotube with Stone Wales defects under uniaxial pressure: A computational study, *Computational Condensed Matter*, 19 (2019) e00378.

- [14] **J.A. Talla**, *Water Molecule Adsorption in Carbon Nanotubes with Haeckelite Structure: First Principles Study*, *Advanced Science, Engineering and Medicine*, 11 (2019) 5.
- [15] **J.A. Talla**, **K.A. Al-Khaza'leh**, **A.A. Ghozlan**, *Boron Nitride Nanotubes as a Container for 5-Fluorouracil Anticancer Drug Molecules: Molecular Dynamics Simulation Study*, *Advanced Science, Engineering and Medicine*, 11 (2019) 1-6.
- [16] **S.A. Salman**, **J.A. Talla**, **M.A. Al-Othoum**, *Uniaxial tension/compression effects on the electrical properties of carbon nanotube bundles: A first-principles study*, *Materials Express*, 8 (2018) 353-360.
- [17] **J.A. Talla**, **M. Nairat**, **K. Khazaeleh**, **A.A. Ghozlan**, **S.A. Salman**, *Optical properties of carbon nanotubes with Haeckelite structure under a transverse electric field: Density functional theory*, *Computational Condensed Matter*, 16 (2018) e00311.
- [18] **J.A. Talla**, *Band-gap modulation of carbon nanotubes with Haeckelite structure under a transverse electric field: A first principle study*, *Computational Condensed Matter*, 15 (2018) 25-30.
- [19] **J.A. Talla**, **A.A. Ghozlan**, *Effect of Haeckelite Structure on Optical Properties of Carbon Nanotubes Bundles: Density Functional Theory Study*, *Journal of Advanced Physics*, 7 (2018) 33-42.
- [20] **J.A. Talla**, **A.A. Ghozlan**, *Effect of boron and nitrogen co-doping on CNT's electrical properties: Density functional theory*, *Chinese Journal of Physics*, 56 (2018) 740-746.
- [21] **Jamal Talla**, **Majid Abusini**, **Khaled Khazaeleh**, **Rami Omari**, **Mohammed Serhan**, **H. El-Nasser**, *Tuning electronic properties and band gap engineering of defective carbon nanotube bundles: First principles calculations*, *Materials Express*, 7 (2017) 516-522.
- [22] **T. Jamal A**, **S. Saed A**, *Electronic Structure Tuning and Band Gap Engineering of Carbon Nanotubes: Density Functional Theory*, *Nanoscience and Nanotechnology Letters*, 7 (2015) 6.
- [23] **S.A. Salman**, **J.A. Talla**, **A. Abuzir**, **E. Yasin**, *Uniaxial Strain Effects on Electronic Properties of Non-Armchair Single-Walled Carbon Nanotubes: First Principles Study*, *Journal of Computational and Theoretical Nanoscience*, 12 (2015) 8.
- [24] **J.A. Talla**, **S.A. Salman**, *Electronic Structure Tuning and Band Gap Engineering of Carbon Nanotubes: Density Functional Theory*, *Nanoscience and Nanotechnology Letters*, 7 (2015) 1-6.
- [25] **J.A. Talla**, **Saed A.;** **Sabbah**, **Hussien;** **Yasin, Esam;** **Zir, Alaa Abu**, *Modeling Single-Walled Boron Nitride Nanotube Pressure Sensor: Density Functional Study*, *Nanoscience and Nanotechnology Letters*, 7 (2015) 381-386.
- [26] **Jamal A. Talla**, **Ayman Sawalha**, **H. Sabbah**, *Structural Characterization of Deformed Boron Nitride Nanotubes*, *Journal of Computational and Theoretical Nanoscience*, 11 (2014) 1-6.
- [27] **J.A. Talla**, *Structural Transformation of SWCNTs/ Polycarbonate Composite: Simulations of X-ray Diffraction*, *Journal of computational and theoretical nanoscience*, 11 (2014) 540-543.

- [28] **Jamal A Talla**, Abdullah Al-Sharif, A. Al-Jaafari, a.H. Sabbah, *Pressure-induced Phase Transitions of Single-Walled Carbon Nanotubes: Simulations of X-ray Diffraction*, *Journal of Computational and Theoretical Nanoscience* 10 (2013) 1-5.
- [29] **J.A. Talla**, *Pressure-induced Phase Transitions of Multi-Walled Carbon Nanotubes: Structural Characterization by Simulation of X-ray Diffraction Profiles* *Journal of Computational and Theoretical Nanoscience*, 10 (2013) 1-5.
- [30] **J.A. Talla**, *Mechanical Twisting of Individual Single-Walled Carbon Nanotubes: Structural Characterization by Simulations of X-Ray Diffraction*, *Nanoscience and Nanotechnology Letters* Vol. 5 (2013) 1-7.
- [31] S.A. Curran, **J. Talla**, D. Birx, D.L. Carroll, D. Zhang, S. Roth, S. Dias, *Formation of nanocomposites using carbon nanotubes as fillers, and their application in NEMSs devices*, *Tenth International Conference on the Science and Application of Nanotubes*, Tsinghua University Beijing, China, (2010) 31.
- [32] **Talla, Jamal A**, *First principles modeling of boron-doped carbon nanotube sensors*, *Physica B: Condensed Matter*, 407 (2012) 966-970.
- [33] **J. Talla**, S. Curran, S. Dias, J. Dewald, *Fabrication and Characterization of Optic Fiber-Based Poly(3-hexylthiophene) Micro Concentrator Photovoltaic Cell*, *Materials Express*, 1 (2011) 336-342.
- [34] S.A. Curran, **J.A. Talla**, D. Zhang, D.L. Carroll, *Defect-induced vibrational response of multi-walled carbon nanotubes using resonance Raman spectroscopy*, *Journal of Materials Research*, 20 (2005) 3368-3373.
- [35] K. Shen, S. Curran, H. Xu, Y. Jiang, J. Dewald, **J. Talla**, T. Pietra, *Hydrogen adsorption of single-walled carbon nanotubes under high pressure: A combined nuclear magnetic resonance and Raman study*, in: *ACS Division of Fuel Chemistry, Preprints*, San Diego, CA, 2005, pp. 410-411.
- [36] **J. Talla**, D. Zhang, M. Kandadai, A. Avadhanula, S. Curran, *A resonance Raman study of carboxyl induced defects in single-walled carbon nanotubes*, *Physica B: Condensed Matter*, 405 (2010) 4570-4573.
- [37] S. Curran, **J. Talla**, S. Dias, J. Dewald, *Microconcentrator photovoltaic cell (the m-C cell): Modeling the optimum method of capturing light in an organic fiber based photovoltaic cell*, *Journal of Applied Physics*, 104 (2008).
- [38] **J.A. Talla**, *Ab initio simulations of doped single-walled carbon nanotube sensors*, *Chemical Physics*, 392 (2012) 71-77.
- [39] **J.A. Talla**, D. Zhang, S. Curran, *Electrical transport measurements of highly conductive nitrogen doped multiwalled carbon nanotubes/poly(bisphenol A carbonate) composites*, *Journal of Materials Research*, 26 (2011) 2854-2859.

- [40] K.S. Liao, **J.A. Talla**, S.D. Yambem, D. Birx, G. Chen, F. Coldren, D.L. Carroll, L. Ci, P.M. Ajayan, D. Zhang, S.A. Cumin, *Formation of highly conductive composite coatings and their applications to broadband antennas and mechanical transducers*, *Journal of Materials Research*, 25 (2010) 1741-1747.
- [41] S.A. Curran, **J. Talla**, S. Dias, D. Zhang, D. Carroll, D. Birx, *Electrical transport measurements of highly conductive carbon nanotube/poly(bisphenol A carbonate) composite*, *Journal of Applied Physics*, 105 (2009).
- [42] J.L. Dewald, **J. Talla**, T. Pietrass, S.A. Curran, *Defect analysis of carbon nanotubes*, in: *AIP Conference Proceedings*, Kirchberg, Tirol, 2005, pp. 215-219.
- [43] M. DeAntonio, L.M. Sandoval, J. Dewald, H.F. Al-Ta'ani, **J. Talla**, *Work in progress - The use of team-based learning in an experimental physics lab*, in: *Proceedings - Frontiers in Education Conference, FIE*, Milwaukee, WI, 2007, pp. S1A13-S11A14.
- [44] Seamus Curran, **Jamal Talla**, S. Dias, *Antennas based on a conductive polymer composite and methods for production thereof*, *US Patent*, 8 (2012) 305.