

Curriculum Vitae: Hussein Shanak

Associate Professor in Physics

Permanent work address:

Department of Physics
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Personal Information:

- **Name:** Hussein Shanak
- **Place of Birth:** Ta`nak / Jenin
- **Marital Status:** Married, four Kids: Sharif, Liane, Noor and Yousuf.
- **Nationality:** German, Palestinian

Education:

- Ph.D. in Solid State - Condensed Matter Physics (Thin Film Nanotechnology), Saarland University, Saarbruecken/Germany, **2005**.
Title of the Ph. D. Thesis:
“Optimization of Transition Metal Oxide Films of WO_3 and V_2O_5 for Electrochromic and Gasochromic Applications in Smart Windows”
- M.Sc. in Physics, University of Jordan, Amman, Jordan, **1998** *Title of the M. Sc. Thesis:*
“Normal and Enhanced Ion-Exchange Processes of Ag and Tl in Glass”
- B.Sc. in Physics, An-Najah National University, Nablus, Palestine, **1994**
- Secondary School Certificate (Tawjihi) Silet Al-Hartheyyeh Secondary School, **1988**

Academic Honors:

- Scholarship for a Ph.D. Program from the German Academic Exchange Service (DAAD, Deutscher Akademischer Austausch Dienst), **04/2001 - 06/2005**.
- Invited by DAAD-Foundation to participate in the Meetings for Nobel Prize Winners with Young Scientists in Lindau/Germany on Lake Constance “**18th Meeting of Nobel Laureates in Physics**” **27 June- 2 July 2004**

Professional and Teaching Experience:

- Dean of Graduate Studies, Palestine Technical University-Kadoorie, from **26.07.2018** until **present**.
- Dean of student affairs, Palestine Technical University-Kadoorie, from **01.09.2016** until **31.07.2018**.
- Dean Faculty of Sciences and Arts, Palestine Technical University-Kadoorie, from **01.09.2014** until **31.08.2016**.
- **Associate Professor** at the Department of Physics, Palestine Technical University Kadoorie, Tul-karm Palestine, since **01.09.2015** until **present**.
- **Senior scientist** at the physics department, work group of nanostructural research and nanotechnology from **September 10th, 2012** until **June 30th, 2014**. The tasks included (i) research in the field of scanning tunneling microscopy on Graphene; (ii) teaching of students ranging from practical courses to instruction and supervision of PhD students during their theses; (iii) Administration (Coordinator) of the EU-funded project “Magnetism Network of the Greater Region- GRMN”, which belongs to Saarland University, University of Lorraine and Technical University Kaiserslautern. The activities of the GRMN project included technology transfer, developing of exhibits, organizing workshops, invention of innovative experimental tools and education in the field of magnetism
- Chair of Physics department, Palestine Technical University-Kadoorie, from **01.08.2010** until **31.08.2012**.
- Assistant Professor at the Department of Physics, Palestine Technical University Kadoorie, Tul-karm Palestine, since **06.09.2009** until **31.08.2015**.
- **Post-Doc** at the Institute of Experimental Condensed Matter Physics, Duesseldorf University, Germany, from **01.08.2007** to **05.09.2009**. Mainly, I supervised Master students in different fields. The first field is the Mesoscopic Transport and the Quantum Hall Effect in Graphene (one Graphite layer); the second one is the Production of Polypyrrol Thin Films to be used as gas-, pH- and bio-sensors. The third field is the Production of WO₃ Nanorods to be investigated as gas sensors. Additionally, I participated in the teaching activities at the department.
- **Post-Doc** at the Department of Experimental Physics (Prof. Rolf Pelster), Saarland University, Saarlouis, Germany, **01. 09. 2005 – 31.07.2007**. The field of the Post doc was performing Crystallographic Investigations (Phase and Texture Analysis) to study the influence of Drawing on the Crystal Structure and Orientation of Polyamide6 Films for Industrial Applications, the project was in cooperation with BASF Company. During my Post Doc, I was involved in teaching of different labs.
- **Lecturer** at Al-Quds Open University, Jenin, Palestine, **1998- 2000**
- **Teaching and Research Assistance**, Physics Department, Faculty of science, University of Jordan, Amman, Jordan, **1996-1998**.

Teaching Experience:

I taught the following courses for several times: Physics 1, Physics 2, Physics 3, Modern Physics, Material Sciences, Quantum Mechanics I, Quantum Mechanics II, Research Methodology, Optical physics, Solid State Physics and Semiconductor Devices. Physics for Medical Students, Physics Labs 1, Physics labs 2, Intermediate Physics Labs, Physics Labs for Medicine, Physics labs for Biology.

Awards:

- **SESAME** Project: Title: XAFS investigations of ZnO nanoparticles and ZnO nanoparticles mixed with conjugated (P3HT) or (PVK) polymers.
Proposal number: 20190128 , October, 2020
- German government (**DAAD**) research fellowship, Saarland University, Germany, June 2017
- A German government (**DAAD**) research fellowship, Duesseldorf University, Germany, June 2011.
- A German government (**DAAD**) research fellowship, Saarbrücken University, Germany, July 2011.
- Scholarship for a Ph.D. Program from the German Academic Exchange Service (DAAD, **Deutscher Akademischer Austausch Dienst**), **04/2001 - 06/2005**.
- Invited by DAAD-Foundation to participate in the Meetings for Nobel Prize Winners with Young Scientists in Lindau/Germany on Lake Constance “**18th Meeting of Nobel Laureates in Physics**” **27 June- 2 July 2004**

Experimental Experience:

I am well experienced with: **RBS** (Rutherford Backscattering Spectrometry), **NRA** (Nuclear Reaction Analysis), **PVD** (Physical Vapor Deposition: Sputtering Techniques), Spin-Coating, **AFM** (Atomic Force Microscope), **XRD** (X-ray Diffraction): Phase and Texture Analysis, **SEM** (Scanning Electron Microscope), **EDX**, (Energy Dispersive XRay Analysis), Optical and Electrical measurements, **IR** (Infrared), **STM** (scanning tunneling microscopy), Optical and Electron Beam Lithography. Graphene production, I have a good computer literacy.

Conferences:

- Chair of Scientific Committee for the „ First International Palestinian Conference on Peaceful Usage of Atomic Energy, to be held at PTUK, Tulkarem palestine ,19-20 December 2017

- Sixth Palestinian conference on modern trends in Mathematics and Physics, Palestine Technical University -Kadoorie, Tulkarem, Palestine, 5-8 August **2018**
- Fifth Palestinian conference on modern trends in Mathematics and Physics, Arab American University, Jenin, Palestine, 31 July- 2August **2016**
- The second international Palestinian conference on nanotechnology and material sciences, Nablus, Palestine 23-25 March 2016.
- Conference of the Deutsche Physikalische Gesellschaft **DPG**, Dresden, Germany, 30 March- 04 April **2014**.
- Conference of the Deutsche Physikalische Gesellschaft **DPG**, Regensburg, Germany, 10-15 March **2013**.
- Third Palestinian conference on modern trends in Mathematics and Physics, Palestine polytechnic university, Hebron, Palestine, 16-18 July **2012**.
- The first international Palestinian conference on nanotechnology for advance material devices, Najah University, Palestine technical university-Kadoorie and Illinois Urbana-Champaign university, Nablus & Tulkarm, Palestine, 26-28 march, **2012**.
- Conference of the Engineering of Functional Interfaces EnFI 2010, July 15&16, Philipps University, Marburg, Germany, **2010**.
- Conference of the Deutsche Physikalische Gesellschaft **DPG**, 25-29 February **2008**, Berlin, Germany.
- Conference of the Deutsche Physikalische Gesellschaft **DPG**, 26-31 March **2007**, Regensburg, Germany.
- 6th International Meeting on Electrochromism, IME6, 29 August to 2 September **2004**, Brno University of Technology, Brno, Czech Republic
- 5th International Conference on Coatings on Glass, ICCG5, 4-8 July **2004**, Saarbruecken/Germany

Workshops:

- Research Quality systems: Proposal development, Research Administration and Dissemination Implemented by the University of Notre Dame, Institute of Global development, for the creation of Research Hub in Palestine, 20-22 October, 2018
- Research ethics, Implemented by the University of Notre Dame, Institute of Global development, for the creation of Research Hub in Palestine, 12-14 October, 2018
- Workshop of the Palestinian German science bridge, Jolish, Germany, **2018**
- Workshop “Business meet Research” in central for productivity and technology production, Saarbuecken, Germany, **September 24, 2013**.
- Workshop on magnetism and technology transfer, Jean lamour institute, University of Lorraine, Nancy, France, 16-19 September, **2013. (Organizer)**
- Workshop “Business meet Research” in central for productivity and technology production,- Lux-Innovation- Luxemburg, Luxemburg, **May 7/8, 2013**

- Workshop on technology transfer between basic research and small and medium enterprises “Labor Talks“, Saarland university, Saarbrücken, Germany, 20 March, **2013. (Organizer)**
- Participated in the first PFDP (The Palestinian Faculty Development Program) National Roundtable Seminar titled “History and Development of World Universities and Higher Education Systems” from September 23-24, **2011** in Ramallah organized by AMIDEAST
- Research in Europe: How to finance research projects and how to establish research groups, 05 December **2007**, University of Cologne, Cologne, Germany

Languages:

- **Arabic:** mother tongue
- **English:** very good in written and spoken
- **German:** very good in written and spoken

Publications:

In Journals:

- Zubair Akbar Qureshi, Sardar Bilal, Imtiaz Ali Shah, Ali Akgül, Rabab Jarrar, **Hussein Shanak** and Jihad Asad, Computational Analysis of the Morphological Aspects of Triadic Hybridized Magnetic Nanoparticles Suspended in Liquid Streamed in Coaxially Swirled Disks, *Nanomaterials*, 12, 671. <https://doi.org/10.3390/nano12040671>, **2022**.
- Jihad Asad, P.Mallick, M.E.Samei, B.Rath, Prachiprava Mohapatra, **Hussein Shanak**, Rabab Jarrar; Reply to comment on “Asymmetric variation of a finite mass harmonic like oscillator” *Results in Physics*, Vol. 32, 105148, January **2022**.
- Biswanath Rath, Jihad Asad, **Hussein Shanak**, Rabab Jarrar and Mohammed K.A.Kabbar, Investigation of the Infinite Discrete Levels from Finite discrete Levels in Position Dependent Mass Quantum Systems, *European Journal of Pure and Applied Mathematics*, Vol. 15, No. 1, 2022, 238-248, **2021**.
- **H. Shanak**, R. Jarrar, H. Khalilia, J. Asad, Numerical Aspects of the Kinematics Behaviour of Coupled Pendulum, *Journal of Engineering Science and Technology*, Vol. 16, No. 5, 4016 – 4026, **2021**.
- **H. Shanak**, H. Khalilia, R. Jarrar, J. Asad, Numerical study of coupled oscillator system using the classical Euler-Lagrange equations, *Mechanics and Mechanical Engineering*; 25 (1):1–5, <https://doi.org/10.2478/mme-2021-0001>, **2021**.
- J. Asad, R. Jarrar, H. Khalilia, S. Mallak, **H. Shanak**, The Mechanics of the Vibrating Triangle System, Bulletin of the Transilvania University of Brasov, Series III: Mathematics and Computer Science, Vol. 1(63), No. 1 - 2021, 27-38, **2021** <https://doi.org/10.31926/but.mif.2021.1.63.1.3>

- V.S. Erturk, J. Asad , R. Jarrar, **H. Shanak**, H. khalilia, The Kinematics Behaviour of Coupled Pendulum using Differential Transformation Method, *Results in Physics*, Vol 26, 104325, DOI: <https://doi.org/10.1016/j.rinp.2021.104325>, **2021**.
- B. Rath, J. Asad, P. Mallick, M.Samei , **H. Shanak**, R. Jarrar , Position Dependent Finite Symmetric mass Harmonic Like Oscillator: Classical and Quantum Mechanical Study, *Open Physics*, 19: 266–276, 2021, Manuscript DOI: 10.1515/phys-2021-0024. Published by De Gruyter. , **2021**.
- **H. Shanak**, R. Jarrar, H. Khalilia, J. Asad, Some Features of Double Pendulum System – Numerical and Simulation Study, *Journal of theoretical and applied mechanics*, Vol 51, Issue 1, pp 076-091, **2021**.
- **H. Shanak**, R. Jarrar, J. Asad, The Two- Point Capacitance for an Infinite Face Centered Cubic Network , *Journal of Electrical Systems*, Vol 16, No 4, pp 491-497, **2020**.
- J. Asad, P. Mallick, M.Samei, B. Rath,, **H. Shanak**, R. Jarrar, Asymmetric variation of a finite mass harmonic like oscillator, *Results in Physics*, Vol. 19 , pp 10335, **2020**.
- **H. Shanak**, O. Florea, N. Alshaikh, J. Asad, Mathematical and numerical Approach for Telegrapher Equation, *Acta Technica Napocensis Series: Applied Mathematics, Mechanics, and Engineering*, Vol. 63, Issue II, pp 143-148, **2020**
- **H. Shanak**, E. Jarrad, J. Asad, Experimental and theoretical Investigation of Perturbed Infinite Network of Identical Resistors, *Journal of Electrical Systems*, Vol 15, No 4, pp 514-525, **2019**.
- A. Abu-As'ad, **H. Shanak**, J. Asad, Classical Features of the Motion of A Heavy Bead Sliding on A Rotating Wire, *Journal of theoretical and applied mechanics*, Vol 49, Issue 3, pp 224-232, **2019**.
- **H. Shanak**, A. Naumann, J. Lion, Goetz and R Pelster, Orientation of Nano-crystallites and Anisotropy of Uniaxially Drawn α -Polyamide 6 Films: XRD, FTIR and Microwave Measurements, DOI: 10.1007/s10853-014-8515-6, *Journal of materials Sciences*, Vol. 49, No 23, pp 8074-8083, **2014**.
- **H. Shanak**, Investigation of the gasochromic behavior for Nickel Oxide Thin films using UV-VIS-NIR Spectroscopy, *Surface Review and Letters*, Vol. 21, No. 3, 1450043, **2014**.
- **H. Shanak**, Influence of aging, poisoning and residual charges on the gasochromic behavior of WO_3 thin films, *Palestine Technical University Research Journal*, 1 (1), 2934, **2013**.
- M. El Achhab, **H. Shanak**, and K. Schierbaum, NO_2 sensing properties of WO_3 nanorods grown on mica, *Physica Status Solidi (a)* 208, No. 6, 1229–1234, **2011**.
- S. Barnoss, **H. Shanak**, C. Bof Bufon and T. Heinzl, Piezoresistance in chemically synthesized polypyrrole thin films, *Sensors and Actuators A*, Vol. 145, No.1, **2009**
- **H. Shanak**, K.H. Ehses, P. Leibenguth, W. Goez and R. Pelster, X-Ray Diffraction investigations of α -Polyamide 6: Structural change and Orientation upon Uni- and Biaxial Drawing, *Journal of Material Sciences*, Vol. 44, No. 2, 655-663, **2009**.

- **H. Shanak**, H. Schmitt, Fast coloration in sputtered gasochromic tungsten oxide films, *Physica Status Solidi (a)* 203, No.15, 3748-3753, **2006**.
- J. Nowoczin, **H. Shanak**, K.-H. Ehses, C. Ziebert, H. Schmitt, Gasochromic Tungsten Oxide-based Film Structure, *Phys. Status. Solidi (a)* 202, No. 6, 1073-1080, **2005**.
- **H. Shanak**, H. Schmitt, J. Nowoczin, K.-H. Ehses, Effect of O₂ Partial Pressure and Thickness on Gasochromic Coloration of V₂O₅ Films, *Journal of Material Science* Vol. 40, No. 13, 3467-3474, **2005**.
- **H. Shanak**, H. Schmitt, J. Nowoczin, C. Ziebert, Effect of Pt-Catalyst on Gasochromic WO₃ Films: Optical, Electrical and AFM Investigations, *Solid State Ionics* 171/1-2, 99106, **2004**.
- G. Saffarini, H. Schmitt, **H. Shanak**, J. Nowoczin, J. Müller, Optical band gap in relation to the average coordination number in Ge-S-Bi thin films, *Physica Status Solidi (b)* 239, 251-254, **2003**.

In conferences:

- K. Awawdeh, **H. Shanak**, Indoor Radon-222 Concentration Levels Measurements in Buildings at Palestine Technical University-Kadoorei, Sixth Palestinian Conference on Modern trends in Mathematics and Physics, held at PTUK, Tulkarm, Palestine, 5-8 August **2018**.
- **H. Shanak**, Graphene as a new dimension for carbon based electronic, Fifth Palestinian conference on modern trends in Mathematics and Physics, 31 July-2 August, Arab American University, Jenin, Palestine, **2016**.
- **H. Shanak**, et al, XRD investigations of a-polyamide 6 films: orientation of nanocrystallites and structural changes upon uni- and biaxial drawing, The second international Palestinian conference on nanotechnology material sciences, Najah university, Nablus, Palestine, **2016**
- **H. Shanak**, A. Holtsch, T. Euwens and U. Hartmann, Impact of the substrate on the electronic properties of Graphene, Conference of the Deutsche Physikalische Gesellschaft DPG, 30 March- 4 April, **2014**, Dresden, Germany.
- A. Holtsch, Euwens, **H. Shnank** and U. Hartmann, Scanning tunneling spectroscopy of moire patterns on Graphene/Rh(111), Conference of the Deutsche Physikalische Gesellschaft DPG, 30 March- 4 April, **2014**, Dresden, Germany.
- T. Euwens, A. Holtsch, **H. Shnank** and U. Hartmann, Varied moire patterns of graphene/Rh (111) measured by scanning tunneling microscopy, Conference of the Deutsche Physikalische Gesellschaft DPG, 30 March- 4 April, **2014**, Dresden, Germany.
- A. Holtsch, **H. Shanak**, U. Hartmann, Electronic transport of metallic thin films and islands on graphene with scanning tunneling spectroscopy, Conference of the Deutsche Physikalische Gesellschaft DPG, 10-15 March **2013**, Regensburg, Germany.

- **H. Shanak**, Electrical transport in Graphene layers, Third Palestinian conference on modern trends in Mathematics and Physics, 16-18 July, Palestine polytechnic university, Hebron, Palestine, **2012**.
- **H. Shanak**, A. Huetten, R. Schloesser and T. Heinzl, Magnetotransport in graphene, The first international Palestinian conference on nanotechnology for advance material devices, 26-28 march, Organized by Najah, Kadoorie and Illinois Urbana-Champaign universities, Nablus & Tulkarm, Palestine, **2012**.
- M. El Achhab, **H. Shanak**, and K. Schierbaum, NO₂ sensing properties of WO₃ nanorods grown on mica, Conference of the Engineering of Functional Interfaces EnFI 2010, July 15&16, Philipps University, Marburg , Germany, **2010**.
- A. Naumann, **H. Shanak**, K.-H. Ehses, J. Lion, W. Goetz and R. Pelster, Microstructure and anisotropic properties of Polyamide 6 films Conference of the Deutsche Physikalische Gesellschaft DPG, Berlin, Germany, 25-29 Feb. **2008**.
- **H. Shanak**, K. -H. Ehses, J. Lion, P. Leibenguth and R. Pelster, Orientation and structural changes upon uni- and Biaxial drawing of polyamide 6, Conference of the Deutsche Physikalische Gesellschaft DPG, Regensburg, Germany, 26-31 March **2007**.
- **H. Shanak**, H. Schmitt, J. Nowoczin, K.-H. Ehses, DC-Sputtered V₂O₅ Thin Films: Effect of O₂ Partial Pressure and Thickness on Optical and Electrical Properties: Proc. of the 5th International Conference on Coating on Glass, ICCG5, 513-520, **2004**.

Under preparation:

- A. Holtsch, Euwens, **H. Shnank** and U. Hartmann, Scanning tunneling spectroscopy of moire patterns on Graphene/Rh(111) (to be submitted)
- **H. Shanak**, H. Schmitt, K.-H. Ehses, Structural evolution during the hydrogenation of sputtered V₂O₅ films (to be submitted).
- **H. Shanak**, M. El Achhab, T. Heinzl, Influence of humidity on the sensing properties of polypyrrole thin films (to be submitted).
- A. Huetten, **H. Shanak**, and T. Heinzl, Weak Localization in Graphene (to be submitted).

Memberships:

Member in the German Physical Society -Deutsche Physikalische Gesellschaft DPG since 2003 until present.

Miscellaneous

- Chair of the council of graduate studies at PTUK
- Member of the academic quality committee at PTUK
- Member of the scholarship committee at PTUK

- Member of the committee of international academic cooperation at PTUK.
- Member of the steering committee for the Graman-Palestinian Scientific predge
- Member of the steering committee for the Kanadian-Palestinian Scientific predge.
- Prepared a proposal for a Master program in Physics, Palestine Technical University – Kadoorie and it was approved in 2020/2021
- Participated in preparing proposals for several Master and Bachelor programs, Palestine Technical University- Kadoorie and they were approved.
- Member of the Organizing Committee of the Sixth Palestinian Conference on Modern trends in Mathematics and Physics, held at PTUK, Tulkarm, Palestine, 5-8 August 2018.
- Member of the Scientific Committee of the Sixth Palestinian Conference on Modern trends in Mathematics and Physics, held at PTUK, Tulkarm, Palestine, 5-8 August 2018.
- Chair of Scientific Committee for the „ First International Palestinian Conference on Peaceful Usage of Atomic Energy, to be held at PTUK, Tulkarem palestine ,19-20 December 2017.
- Member of the National Committee for the management of the Synchrotron project (**SESAME**), since 2017 until present.
- Member of the elected administrative board of the workers union at Palestine Technical University-Kadoorie since 2019 until now.
- Chairman of the Student Council Elections Committee at Palestine Technical University-Kadoorie, 2017/2018 and 2018/2019.
- Member in the organizing committee for the Fifth Palestinian Conference on Modern Trends in Mathematics and Physics, AAUJ, Jenin 31 July -2 August 2016
- Member of the Organizing Committee of the The second international Palestinian conference on nanotechnology and material sciences, Nablus, Palestine 23-25 March 2016.
- Coordinator of the Fourth Palestinian Forum for Teaching and Learning Mathematics, held on 10 may 2015, PTUK
- Chair of organizing committee for the „ Palestinian conference on Innovation in teaching and learning : from policy to practes, at PTUK, Tulkarem palestine ,14-16 December 2014
- Member for the organizing committee for a Workshop on magnetism and technology transfer, Jean lamour institute, University of Lorraine, Nancy, France, 16-19 September, **2013**.
- Organizer for a Workshop on technology transfer between basic research and small and medium interpreises “ Labor Talks“, Saarland university, Saarbrequen, Germany, 20 March, 2013.
- Member of the Organizing Committee of the First Palestinian Forum for Teaching and Learning Mathematics, held on May 2012, PTUK
- Member of the local Organizing Committee of the 'First Palestiniene International Conference of Nanotechnology for Advanced Material & Devices' (Organizations:

University of Illinois at Urbana-Champaign, An Najah National University & Palestine Technical University-Kadoorie), , **Nablus & Tulkarm, Palestine, 26-28 march, 2012**

- University Council 2011-2012 and 2014 until present.
- Deans Council since 2014 until present
- Faculty Council 2009-2012 and 2014-2016.
- An External Examiner for Several master students at different Palestinian universities.
- Reviewer for many articles in several respected local and international journals.

References:

Available upon request.