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Address

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Career Objective

Be a good contributor in the field of semiconductor quantum dot, optics and nonlinear optoelectronics devices dynamics, particularly in the area of encrypted optical communications, QD- laser dynamics, QD- LED dynamics and quantum optics. Such issues like chaos control and synchronization and its applications in secure communications are considered. In addition to be a successful university educator in applied nonlinear dynamics, optical communications, mathematical physics and nanomaterials properties.

Personal

Born May 03, 1973 in Thi-Qar-Iraq, married, five children.

Education

- PhD. In Physics (Laser and Electro-Optics Physics). Baghdad University, College of Science, 2015, average 87, the first order.
- M. Sc. In Physics (laser and optics). Baghdad University, College of Science for Women, 2009, average 89.52, the first order.
- B. Sc. In Physics, Basrah University, College of Education, 1996, average 65.15.

Professional Experience

- June 2016-Until now: Assistance Professor, Department of Physics, Science College, University of Thi-Qar (Nasiriya Nanotechnology Research Laboratory (NNRL)).
- April 2012- June 2016 Lecturer, Department of Physics, Science College, University of Thi-Qar (Nasiriya Nanotechnology Research Laboratory (NNRL)).

- April 2009- April 2012 Assistance lecturer, Department of Physics, Science College, University of Thi-Qar (Nasiriya Nanotechnology Research Laboratory (NNRL)).
- August 2002-sptember 2006: Graduate teaching assistance, Department of Physics, Science College, University of Thi-Qar.

Awards and Honors

- 2002-2018 Many thanks and awards are directed from Ministry of higher education , Thi-Qar University, and sciences collage.

Research Interests

Applied research in semiconductors quantum dots, nonlinear dynamics and its applications in telecommunications, and nonlinear optics and optoelectronic devices.

Detail of courses I have taught.

1. Nanotechnology
2. Laser physics and applications
3. Laser communications.
4. Optics.
5. Laser nonlinear dynamics.
6. Laser spectroscopy.

Publications

A. Journal Papers

[1] H. Al-Husseini, Amin H. Al-Khursan and S. Y. Al-Dabagh "*III-Nitride QD Lasers*", published in Journal. **Open Nanosciences**. V. 3, pp. 1-11, 2009.
DOI: 10.2174/1874140100903010001

[2] A paper titled "*Relative Intensity Noise for Self-Assembled III-Nitrides Quantum-Dot Lasers*", published in Journal. **Recent Patents on Electrical Engineering** 2010, 3, 211-217.

[3] A paper titled "Optical Gain and Threshold Current Density of a P-Doped ZnO/MgZnO Quantum Dot Lasers ", **Physics Express Journal**, Volume 1, Issue 4, 2011.

[4] K. Al Naimee, H. Al Husseini, S.F. Abdalah, A. Al Khursan, A.H. Khedir, R. Meucci, F.T. Arecchi, "*Mixed mode oscillations and chaotic spiking in Quantum Dot Light Emitting Diodes*," Proceedings of the **IEEE** 06/2014;78, DOl;10, 1016/j. chaos, 2015, 07, 033.

[5] H. Al Husseini, A. Al Khursan, K. Al Naimee, S.F. Abdalah, A.H. Khedir, R. Meucci, F.T. Arecchi, "*Modulation Response, Mixed mode oscillations and chaotic spiking in Quantum Dot Light Emitting Diodes*," **ELSEVIER**, Chaos, Solitons & Fractals, Nonlinear Science, and Nonequilibrium and Complex Phenomena, 78, 229–237, 2015.

[6] K. Al Naimee, H. Al Husseini, S.F. Abdalah, A. Al Khursan, A.H. Khedir, R. Meucci, F.T. Arecchi, "*Complex dynamics in Quantum Dot Light Emitting Diodes*," **Eur. Phys. J. D**, 69: 257, 1-5, 2015.

[7] Hussein B. Al Husseini, Kais A. Al Naimee, Amin H. Al-Khursan, and Ali. H. Khedir," *External modes in quantum dot light emitting diode with filtered optical feedback*." **Journal of Applied Physics** 119, 224301 (2016); doi: 10.1063/1.4953651. View online: http://dx.doi.org/10.1063/1.4953651

[8] Hussein B. Al Husseini, Kais A. Al Naimee, Ali. H. Khedir, and Amin H. Al-Khursan," *Dynamics of Quantum Dot Light Emitting Diode with Filtered Optical Feedback*." **Nanomaterials and Nanotechnology journal**. Volume 6: 1–9, 2016. https://doi.org/10.1177/1847980416663673

[9] Hussein B. Al Husseini," *Control of Nonlinear Dynamics of Quantum Dot Laser with External Optical Feedback."* **Journal of Nanotechnology in Diagnosis and Treatment**, 2016, Vol. 3, No. 2

[10] Hussein B. Al Husseini, and Hussein A. Al Rekabie" *Optical Injection Locking in Quantum Dot Light Emitting Diode."* **Journal of Applied Physics & Nanotechnology**, Vol. 1 • Issue 1 • pp 1-5. 2018.

[11] H. Al Husseini, S.F. Abdalah, K. Al Naimee, R. Meucci, F.T. Arecchi, " *Exploring phase control in a quantum dot light-emitting diode*," **Nanomaterials and Nanotechnology Volume 8: 1–7**, 1-7, 2018. https://doi.org/10.1177/1847980418782389

[12] Kais A.M. Al Naimee, Hussein B. Al Husseini, Amin H. Al Khursan, Sora F. Abdalah, Riccardo Meucci and F. Tito Arecchi " *Filtered Optical Feedback in Quantum Dot Light Emitting Diode*," **Materials Science Forum, Vol. 915, pp 171-178. 2018.**

[13] H. Al Husseini, and H. Al Rekabie, " *Selecting Dynamics of the Quantum Dot Light Emitting Diode with a Small Optical Feedback Strength"* **ELSEVIER**, Chaos, Solitons & Fractals, Nonlinear Science, and Nonequilibrium and Complex Phenomena, 118, 199–206, 2019. https://doi.org/10.1016/j.chaos.2018.11.006

[14] H. Al Rekabie, and H. Al Husseini, " *Controlling of the Quantum Dot LED Dynamics with a Small Optical Feedback Strength "***L&H Scientific Publishing, Journal of Applied Nonlinear Dynamics**, 9, 57–70, 2020.

[15] Hussein B AlHusseini, Sora F Abdalah, Amin H AlKhursan, Kais A. AlNaimee, Riccardo Meucci, F Tito Arecchi, "*Encrypted Chaos in Quantum Dot Light Emitting Diode*" **ELSEVIER**, **Chinese Journal of Physics**, 65, 398-404, 2020.

[16] Hussein B AlHusseini, "Evaluation of quantum dot light-emitting diodes synchronization under optically feedback" **DE Gruyter**, J. Opt. Commun. 2020; aop. https://doi.org/10.1515/joc-2020-0110

[17] Ali, H.M., Al Husseini, H.B. *Synchronization of chaotic network quantum dot light-emitting diodes under optical feedback*. **J Opt (2020).** https://doi.org/10.1007/s12596-020-00660-0

[18] Wisam K. Irhaif and Hussein B. Al Husseini, *Stability Analysis and Bifurcation in External Cavity Quantum Dot Semiconductor Laser*, 2nd International Scientific Conference of Al-Ayen University (ISCAU-2020). **IOP Conf. Series: Materials Science and Engineering** 928 (2020) 072042, doi:10.1088/1757-899X/928/7/072042.

[19] Hussein B. Al Husseini, *Synchronization of Delayed Quantum Dot Light Emitting Diodes*, **WSEAS TRANSACTIONS on ELECTRONICS**, Volume 11, 2020 DOI: 10.37394/232017.2020.11.18

[20] Hussein B. Al Husseini, Mustapha A.A Jebar, Salam K. Mousa, *Chaos Modulation Using Synchronization in Quantum Dot Light Emitting Diode with Optoelectronic Feedback*, **NeuroQuantology** , January 2021, Volume 19, Issue 1 | Page 38-48 , doi: 10.14704/nq.2021.19.1.NQ21006.

[21] Hussein B. Al Husseini, Rajaa Hussein Abd Ali, Salam K.Mousa, and Amin H. Al-Khursan, *Quantum-Dot Laser Behavior under External Optical Feedback***, Interciencia Journal,** 46(2), 2021**.**

[22] Ferial. Y. Nazal , Hussein Al Husseini , Hazim R. Akal, *A study effecting of the Power settings for Holmium - YAG laser on lithotripsy time Intra corporeal*, 2nd International Virtual Conference on Pure Science (2IVCPS 2021). IOP Publishing. **Journal of Physics: Conference Series 1999** (2021) 012069 IOP Publishing doi:10.1088/1742-6596/1999/1/012069

[23] Ferial Y Nazal1, Hussein Al Husseini, and Hazim R Akal," Studying the Effect of the Energy Settings of the HO-YAG Laser and the Composition of the Stones on the Fragmentation Time in vitro" University of Thi-Qar Journal of Science (UTsci) ISSN Onlin:2709-0256, ISSN Print: 1991-8690 Volume (8), No.2,Oct.2021 DOI: 10.32792/utq/utjsci.v8i2.818

[24] Sadeq Kh. Ajeel • Rajaa Hussein Abd Ali • Salam K. Mousa • Hussein B. Al Husseini, *Theoretical evidence for synchronous and multi-scroll attractors in coupled quantum dot light-emitting diode*, **J Opt**. The Optical Society of India 2021. https://doi.org/10.1007/s12596-021-00793-w

[25] Rajaa H. Abudali; Sadeq Kh. Ajeel; Salam K. Mousa; Hussein B. Al Husseini, "Phase-Coupled Synchronization with Optoelectronic Feedback" 2022 International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA). **IEEE**. Ankara, Turkey. 10.1109/HORA55278.2022.9799889

[26] Seham A.AlJabri1· Hussein B. Al Husseini," Effect of phase conjugate coupled on routes to chaos in incoherent optical feedback semiconductor quantum dot laser" **J Opt, The Optical Society of India** 2022. https://doi.org/10.1007/s12596-022-00894-0.

[27] Aqel Mashot Jafar , Kawther A Khalaph and Hussein B Al Husseini," Study of the structural, electronic, mechanical, electro-thermal and optical properties of double perovskite structures Cs2SbAgX6, (X = I, Br, or Cl)" **Phys. Scr**. 97 (2022) 085509. https://doi.org/10.1088/1402-4896/ac8189.

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[29] Methag Abdalwahed Kadim , Ali Falah Hassan ,Riccardo Meucci ,Sadiq Kh. Ajeel , Sora F. Abdalah , Amin H. Al Khursan, Hussein B. Al Husseini, Ali Natheer Tuaimah , Kais A. Al Naime and Ali. H. Khidhir "Nonlinear Quantum Dot Light Emitting Diode Dynamics and Synchronization with Optoelectronic Feedback" University of Thi-Qar Journal of Science (UTJsci). 10, 1, (2023)

[30] Ferial Y Nazal1, Hussein Al Husseini, and Hazim R Akal," A Comparison Between Infrared Spectroscopy (IR.) Analysis Techniques and SEM-EDAX in Urolithiasis" International Conference on Scientific Research & Innovation (ICSRI 2022) AIP Conf. Proc. 2820, 020005-1–020005-9; https://doi.org/10.1063/5.0150793 Published by AIP Publishing. 978-0-7354-4559-8

[31] S A Al Jabri and H B Al Husseini" The effect of optical polarized feedback on dynamics of quantum dot semiconductor lasers" Indian J Phys https://doi.org/10.1007/s12648-023-02824-7

[32] Hawraa A. Hussein and Hussein B. Al Husseini "Influence of multi-modes contest on the dynamics of a quantum dot light emitting diode" Published online by De Gruyter July 17, Journal of Optical Communications https://doi.org/10.1515/joc-2023-0131

[33] Alaa S. Mahdi1 · Hussein B. Al Husseini" Filtered optical feedback modes efect on quantum-dot laser behavior" Journal of Optics, The Optical Society of India. 2023.

[34] Alaa S. Mahdi ,Hussein B. Al Husseini," External Filtered Modes of a Quantum Dot Laser Under the Influence of Double-Filtered Optical Feedback" international Journal of Membrane Science and Technology, 2023, Vol. 10, No. 3, pp 3530-3546. DOI: https://doi.org/10.15379/ijmst.v10i3.3396

[35] Hawraa A Hussein, Hussein B Al Husseini, " Modes-competition dynamics in a semiconductor quantum dot light emitting diode subject to optical feedback" Results in Optics,14, 2024. https://doi.org/10.1016/j.rio.2024.100608

[36] Tahani Adil Kareem and Hussein B. Al Husseini, "Optically injected quantum dot lasers and its complex dynamics" De Gruyter . Journal of Optical Communications. 2024; aop. https://doi.org/10.1515/joc-2024-0010

[37] Alaa S. Mahdi ,Hussein B. Al Husseini," Quantum dot laser dynamics and external filtered modes under the influence of double-filtered optical feedback" 2024 *Phys. Scr.* **99** 045108, **DOI** 10.1088/1402-4896/ad2d9f

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B- Chapters in books

[1] A chapter titled "*Different Approaches of Synchronization in Chaotic-Coupled QD Lasers* ", publication in the book " **Chaos Theory**", ISBN: 978-953-51-3946-1 Print ISBN: 978-953-51-3945-4 DOI: 10.5772/intechopen.68716. **InTech** Open Access Publisher. April 4, 2018.

[2] A book titled "*Nonlinear dynamics in quantum dot light emitting diode*", ISBN 978-3-659-83712-8. **Scholar's press**. OmniScriptum GmbH & Co. KG. 2016

[3] A chapter titled "*Factors Affecting the Relative Intensity Noise of GaN Quantum Dot Lasers* ", publication in the book "**Quantum Dots / Book 2**", ISBN 979-953-307-857-0. **InTech**. Open Access Publisher. December 29, 2011.

[4] **A book titled** "***Dynamical analysis of quantum-dot light emitting diode with coexisting multiple attractors***", ISBN *Science*. Generis Publishing. 2021.

C- Conference and Workshop Papers

[1] K. Al Naimee, H. Al Husseini, S.F. Abdalah, A. Al Khursan, A.H. Khedir, R. Meucci, F.T. Arecchi, "*Mixed mode oscillations and chaotic spiking in Quantum Dot Light Emitting Diodes*," in Proceedings **Complexity in Engineering Conference (COMPENG)**, Barcelona, Spain, 2014. (http://www.compeng2014.org/program)

[2] Kais A. Al Naimee, Hussein Al Husseini, Sora F. Abdalah, Amin Al Khursan, Ali H. Khider, Riccardo Meucci, F. Tito Arecchi,,"*Complex dynamics of QD light emitting diode with optoelectronic feedback*," **SPIE Optics + Optoelectronics 2015**. Prague, Czech Republic. Conf. 9503 nonlinear Optics and its applications, p. 13. (www.spie.org/oo15programme.)

[3] S.F. Abdalah, H. Al Husseini, K. Al Naimee, A. Al Khursan, A.H. Khedir, R. Meucci, F.T. Arecchi, "*Chaos Control and Synchronization in Quantum Dot Light Emitting Diodes*," **PhysCon 2015**, 7th international scientific conference on physics and control 19-22 august, 2015, Istanbul, turkey. (http://www.physcon2015.itu.edu.tr)

[4] S.F. Abdalah, H. Al Husseini, K. Al Naimee, A. Al Khursan, A.H. Khedir, R. Meucci, F.T. Arecchi, " *Complex Dynamics in Quantum Dot Light Emitting Diodes*," **PhysCon 2015**, 7th international scientific conference on physics and control 19-22 august, 2015, Istanbul, turkey. (http://www.physcon2015.itu.edu.tr)

[5] S. F. Abdalah, H. Al Husseini, K. Al Naimee, A. Al Khursan, A. H. Khedir, R. Meucci, F. T. Arecchi, "*Chaos Control and Synchronization in Quantum Dot Light Emitting Diodes*," **WSEAS Conference**. Budapest, Hungary December 12-14, 2015. (http://www.wseas.org/main/conferences/2015/Budapest/Program.pdf)

[6] H. Al Husseini, K. Al Naimee, A. Al Khursan, A. H. Khidhir, "*Quantum Dot Light Emitting Diodes with optically filtered feedback*," **Photonics 2016 Conference**. USA Feb. 25, 2016. (http://www.photonics.conferenceseries.com

[7] K. Al Naimee, H. Al Husseini, A. Al Khursan, S.F. Abdalah, R. Meucci, F.T. Arecchi, " *Filtered Optical Feedback in Quantum Dot Light Emitting Diodes*," **PhysCon 2017**, 8th international scientific conference on physics and control 17-19 july, 2017, Florence, Italy. (http://www.physcon2017.)

[8] H. Al Husseini, and H. Al Rekabie, " *influence optical injection locking in Quantum Dot Light Emitting Diodes*," **ICNAMA 2018**, 6th international scientific conference for nanotechnology and advanced materials and their applications 2-3 May, 2018, Baghdad, Iraq.

[9] Attya O. Attya and H. Al Husseini, " Communication in Quantum Dot Light Emitting Diode with Optoelectronic Feedback Technique," University of Thi-Qar Journal of Science (UTsci) The 4th Scientific Conference of Science College/ University of Thi_Qar Volume (7), No.2. 2020.

[10] Huda M. Ali and H. Al Husseini, " Synchronization of Chaotic Quantum Dot Light Emitting Diodes under optical feedback effect," University of Thi-Qar Journal of Science (UTsci) The 4th Scientific Conference of Science College/ University ofThi_Qar Volume (7), No.2. 2020.

[11] Wisam K. Irhaif and Hussein B. Al Husseini, "Stability Analysis and Bifurcation in External Cavity Quantum Dot Semiconductor Laser". 2nd International Scientific Conference of Al-Ayen University (ISCAU-2020), IOP Conf. Series: Materials Science and Engineering 928 (2020) 072042, doi:10.1088/1757-899X/928/7/072042