# NURISYA MOHD SHAH

Department of Physics  $\diamond$  Faculty of Science, University Putra Malaysia  $\diamond$  43400 UPM Serdang  $\diamond$  Selangor (60) · 19 · 2111 240 ◊ risya@upm.edu.my, risyams@gmail.com



# **EDUCATION**

Concordia University, Montréal, Québec, Canada Fall 2014 Doctor of Philosophy (Ph.D) in Physics (Mathematical Physics) Thesis title: Some Families of Complex Biorthogonal Polynomials in a Model of Non-commutative Quantum Mechanics. Degree Conferred, October 3rd, 2014 **RANKING - THESIS: VERY GOOD RANKING - ORAL: GOOD** 

# University Putra Malaysia

M.Sc in Quanta & Space-Time Thesis title: Energy Eigenequation Expansion for a Particle in Singly Punctured Two-torus and Triply punctured Two-sphere Systems. (with distinction)

# University Putra Malaysia

B.Sc. (Honours) in Physics Final Year Project title: Symmetries on Hyperbolic Plane.

# WORK EXPERIENCE

University Putra Malaysia (UPM) Associate Professor

- · Senior Lecturer, (Oct, 2014 2024), Department of Physics, Faculty of Science, University Putra Malaysia (UPM), 43400 Serdang, Selangor
- Research Associate, (Jan, 2022 2026) Laboratory of Computational Sciences and Mathematical Physics, Institute for Mathematical Research (INSPEM), University Putra Malaysia (UPM), 43400 Serdang, Selangor

July 2008

Oct 2002

May, 2024 - present

Serdang, Selangor

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# University Putra Malaysia (UPM) **Tutor**

May 2005 - Sept 2014 Serdang, Selangor

Serdang, Selangor

- · Involved in administrative work such as an organizing committee organizing local & international conference, seminars, lecture series workshop ect.
- · Lab. Coordinator for PHY4602, Computational Physics: Java Programming, 2nd Semester 2013/2014.
- · Facilitator for Physics Teaching Skills Development Training Program for Department of Physics, UPM, Oct-Nov 2013.
- Tutorial Teaching Assistant for PHY2001, General Physics, 2nd Semester 2013/2014.
- · Lab. Coordinator for PHY3101 Sem 1, 2, 2005/2006: Sem 1, 2, 2006/2007: Sem 1, 2007/2008
- · Coordinator for Theoretical Weekly Seminar (TSL) 2005/2006
- · Research Associates for Laboratori Pengajian Teori, INSPEM- July August 2007

#### University Putra Malaysia (UPM) February 2003 - May 2005 Science Officer at Institute of Advanced Studies (ITMA)

- · Involved in administrative work such as an organizing committee organizing local & international conference, seminars, lecture series workshop ect.
- · Proof editor for Buletin ITMA 2003/2004.
- · Coordinator for laboratory facilities (Theoretical Studies Laboratory).
- · Matlab and Mathematica Softwares purchased coordinator.
- · Server Administrator for server itmatsl at www.itmatsl.upm.edu.my, 2003- 2006 (Theoretical Studies Laboratory Server), RedHat Advanced Server 2.4.

# SKILLS

Mathematical Software	Mathematica	
Office/Business Applications	MS Excel, MS PowerPoint, MS Word	
Operating System	Windows 11, Mac OS	
Document application	Have wide experience in TeX/LaTeX document preparation	

# **OTHER INFO**

Google Sites https://sites.google.com/upm.edu.my/nurisyamohdshah/home

# **BIO SKETCH**

Nurisya Mohd Shah received her Ph.D in Physics (Mathematical Physics) in 2014 from Concordia University, Montreal, Canada. She is currently serving as a senior lecturer in theoretical physics at the Department of Physics, Faculty of Science, Universiti Putra Malaysia (UPM). In addition, she is also a research associate at the Laboratory of Computational Sciences and Mathematical Physics, Institute for Mathematical Research (INSPEM) UPM. She also serves as the current coordinator for the department physics program curriculum of UPM. She is also currently a Council Member of Malaysian Institute of Physics (IFM) for the term 2023-2025. In addition, she is part of the Malaysian Quantum Information Initiative (myQI) as the administrative coordinator for the section of quantum information and algorithm (https://www.myqi.my/main).

Dr. Nurisya's main research work is in the area of noncommutative quantum mechanics (NCQM), specializing in biorthogonal polynomials. She is very much interested in the techniques in group theory and operator methods applied in quantum mechanics. She publishes several articles in that related area. She has been actively involved in initiating and developing research in theoretical physics in the department and thus the faculty. She is also the member of the main organizer of Expository Quantum Lecture Series (EQuaLS). EQuaLS is a lecture series hosted by the Institute for Mathematical Research (INSPEM) at Universiti Putra Malaysia (UPM) with the primary objective of the lecture series is to rapidly introduce students to frontier topics in quantum theory and information by inviting international prominent researchers in the relevant area. In 2022, she is the chairman of EQuaLS2022 together with the celebration of the World Quantum Day 2022. In the same year she is the recipient of an international grant, Air Force Office of Scientific Research (AOARD) for the work on quantum error correction.

Despite formal activities like teaching and research, Dr. Nurisya is currently an editor of a local Malaysian website discussing physics named fizikkini.com. She teams work with several other researchers from different local universities to promote physics in Malay language. In the same line, she is also a writer of several popular articles published in local popular science magazine, Dewan Kosmik. Formerly, she represented Malaysia to be the first Malaysia Delegates participating in the Lindau Meeting with Nobel Laureates in Physics, 2004 sponsored by the Academy of Science Malaysia, ASM.

#### TEACHING EXPERIENCE

# **Summary of Teaching**

{Course Code }{Course Name} {Semester}

PHY2001 PHY3401 PHY3600 PHY3601	General Physics Electromagnetism Mathematical Methods in Physics I Quantum Mechanics	Sem 2 2014/15, Sem 2 2018/19 Sem 2 2018/19, Sem 2 2019/20, Sem 1,2 2020/21 Sem 1&2 2021/22, Sem 2 2022/23 Sem 2 2014/15, Sem21 2015/16, Sem 1 2017/18 Sem 2 2017/18, Sem 2 2018/19, Sem 1 2023/2024
PHY3602 PHY3604 PHY4202 PHY4600 PHY4601	Statistical Mechanics Mathematical Methods in Physics Modern Optics Mathematical Methods in Physics II Mathematical Physics	Sem 1 2016/17, Sem 1 2022/23 Sem 1 2015/16, Sem 1 2016/17, Sem 1 2017/18 Sem 1 2015/16 Sem 1 2022/2023, Sem 1 2023/2024 Sem 1 2018/19, Sem 1 2019/20, Sem 1 2019/20, Sem 1 2021/2022
PHY4603 PHY4995	Advanced Quantum Mechanics <sup>1</sup> Advanced Practical Lab.	Sem 1 2019/20, Sem 2 2021/22, Sem 2 2022/23 Sem 2 2017/18

#### SUPERVISION

{Name of student }{Program} {Title of project}{Description}

#### Undergraduate: Final Year Project, FYP

#### Main supervisor: 26 students updated 2023

- 1. Semester 2, 2022/2023
  - (a) NAFISATUL QUROTA AYUN AZAMAN, BSc in Physics (Hons.), Stark Effect
  - (b) SITI MUNIRAH ISMAIL, BSc in Physics (Hons.), Rotation operators of spin 3/2
  - (c) NURUL SYAHIRAH SHAHROL NIZAM, BSc in Physics (Hons.), The Classical Theory of Penning Trap
  - (d) NUR AQILLA HUSNA BADRULHISHAM, BSc in Physics (Hons.), Algebraic Formulation of Kerr Effect
- 2. Semester 2, 2021/2022
  - (a) Brenda Edward, BSc in Physics with Education (Hons.), Construction of SU(1,1) and SU(2) in Quantum Optics
  - (b) Nabila, BSc in Physics with Education (Hons.), Derivation of the Planck Blackbody Spectrum from Thermodynamics
  - (c) Amirul Amin Amran, BSc in Physics with Education (Hons.), Hydrogen Atom in Parabolic Coordinate
  - (d) Muhammad Helmi bin Abdul Halim, BSc in Physics (Hons.), Quantum Teleportation in Qubit
- 3. Semester 2, 2020/2021
  - (a) Timothy Catacutan, BSc (Hons.) in Physics, A Time-Dependent Perturbative Analysis of the Jaynes-Cummings Model
  - (b) Nurfarhana, BSc (Hons.) in Physics, Visualisation of Coupled Isotropic Harmonic Oscillator In Noncommutative Plane
  - (c) Luqman Arif, BSc (Hons.) in Physics, Qutrit in Quantum Computer
- 4. Semester 2, 2019/2020
  - (a) Alif Aiman, BSc (Hons.) in Physics, Energy spectrum of Vee potential
- 5. Semester 2, 2018/2019
  - (a) Pavithra a/p Mohanadas, BSc (Hons.) Major in Physics, Dunckl Oscillator on A Plane
  - (b) Wong Yan Jing, BSc (Hons.) Major in Physics, Factorization Methods and its Application
  - (c) Amir Asyraf Che Adnan, BSc (Hons.) Major in Physics, Schwinger Representations in Quantum Qechanics
- 6. Semester 2, 2017/2018
  - (a) Azwan Ismail Ibrahim, BSc (Hons.) Major in Physics, Quantum Fourier Transform Gate\*\*
- 7. Semester 1, 2017/2018
  - (a) Chew Kang Ying, BSc (Hons.) Major in Physics, Solution of the Schrodinger's Equation for a particle on Equilateral Triangle

- (b) Intan Shaidatul Natasha Pauzi, BSc (Hons.) Major in Physics, *Generating Quantum Entan*glement
- (c) Novia Putri Enzri, BSc (Hons.) Major in Physics, Particle in Spherical Infinite Potential Well
- 8. Semester 1, 2016/2017
  - (a) Nadhira Abd Haris, BSc (Hons.) Major in Material Science, *The investigation of elementary* gates for quantum computation.
  - (b) Nur Afifa Khairul Anuar, BSc (Hons.) Major in Physics, Explicit Derivation of Swap Gate in Qubits.
  - (c) Siti Rahimah Sarnua, BSc (Hons.) Major in Physics, Simulation of one-dimensional quantum harmonic oscillator using C++.
  - (d) Sharon Er Shu Yen, BSc (Hons.) Major in Science Instrumentation, *Electronic Instruments which Specialize in Saponification Process using Arduino based.*
- 9. Semester 2, 2015/2016
  - (a) Che Nurul Hidayah C Samsudin, BSc-Ed. (Physics), Common Misconception in Electricity and Magnetism among university physics student at UPM.
  - (b) Noramirah Haron, BSc-Ed. (Physics), Misconception on propagation of sound wave among university physics student at UPM.
  - (c) Siti Hajar Rahim, BSc-Ed. (Physics), Interactive Courseware: Mirror and Lenses.

#### **Research** Assistant

- 1. Tan Min Yang, on "Shape invariant property in Green factorization and SUSY Quantum Mechanics" - (Jun - Nov 2023)
- Shelawati Tiansin, on "Analytical approach on Energy spectrum of core/shell colloidal quantum dots" - (Oct - Dec 2017)
- Nadhira Abd Haris, on "Two-Dimensional Morse Oscillator: Deformed Generator of Morse 2D" -(Oct - Dec 2017)
- 4. Siti Rahimah Sarnua on "Computational method in quantum harmonic oscillator" (July 2017-Feb 2018)
- 5. Mohd Hazimi Md Nazri working on "Non-commutative Morse Oscillator" (Nov 2016 Jan 2017).

#### Special Graduate Research Assistant, SGRA

- Valentine on "On a proper study of quantum error correcting codes using group theoretic methods" (Mac - Aug 2023)
- Shelawati Tiansin, on "Analytical approach on Energy spectrum of core/shell colloidal quantum dots" - (Oct - Dec 2017)
- Chew Kang Ying, on "Two-Dimensional Morse Oscillator: Deformed Generator of Morse 2D" -(Oct - Dec 2017)
- 4. Tamil Selvam A/L Murugaya on "Computational method in quantum harmonic oscillator" (July 2017-Feb 2018)

5. Shelawati Tiansin working on "Analytical approach on Energy spectrum of core/shell colloidal quantum dots"

# Internship Supervision - Undergraduates from other university

- 1. Muhammad Redza bin Zainudin, UKM (Mac Aug 2022) on transmon qubit
- 2. Muhammad Nazren Nazmi Muhamad Rusli, IIUM (Feb, 10th Sept 2020) on the pictorial of  $_{\rm NCQM}$
- 3. Yap Kian Onn, UTAR (Oct, 1st Dec, 31st 2019)
- 4. Nur Fadhillah Bt. Rahimi, IIUM (Feb 4th July, 19th 2019)

# Postgraduate: Main supervisor

# Ph.D

- 1. Valentine, Ph.D (Mathematical Physics & Engineering), "Group theoretic methods in quantum error correction", starting March 2023. (INSPEM)
- 2. Ahmad Hazazi Ahmad Sumadi, Ph.D (Mathematical Physics & Engineering) INSPEM, On Geometrical Aspect of Quantum Mechanics, main supervisor *retired AP Dr. Hishamuddin Zainuddin* - thesis submitted

# MSc.

- 1. Tan Min Yang, MSc. (Theoretical & Computational Physics), "Quantum Anharmonic Potentials with Operator and Factorization Methods", starting Sept 2020. (Dept. of Physics, Faculty of Science) graduated 2023 graduated 2023
- 2. Tamil Selvam A/L Murugaya MSc. (Mathematical Physics & Engineering), "Pre-Schmidt Mode Parameter of Coupled Oscillators", starting Feb 2020. (INSPEM)
- 3. Chew Kang Ying MSc. (Mathematical Physics & Engineering), "Quantum Circuit Complexity in Riemannian Geometry of 3-Qubit Quantum Fourier Transform", starting Sept 2018. (INSPEM) graduated 2023
- 4. Nadhira Abd Haris, MSc. (Mathematical Physics & Engineering), "Deformed Ladder Operators Arising in Noncommutative Quantum Mechanics", (INSPEM) graduated 2022
- 5. Shelawati Tiansin, MSc. (Physics), "Computational Analysis in Estimating Transition Energy of Core-Shell Quantum Dots and The Effective Mass of Charge Carriers', Dept. of Physics, Faculty of Science graduated 2021

# Postgraduate: Co-supervisor/member

# Ph.D

- 1. Muhammad Luqman Arif Mohamad, PhD. (Computer and Embedded Systems Engineering), main supervisor Mohd Amiruddin Abd Rahman starting Oct 2022 (Faculty of Science)
- 2. Hassan Ahmed Jaber Hassan, PhD (Theoretical & Computational Physics), "DFT on Bilayer Graphene Heterostructure" main supervisor Dr. Chan Kar Tim starting Oct 2021 (Faculty of Science)

- 3. M.A.M.A. Ahmed, Ph.D. (Mathematical Physics & Engineering) INSPEM, On Thermal Field Dynamics, main advisor AP Dr. Hishamuddin Zainuddin graduated 2022
- Abdulbaset A.Abdulla Awshah, Ph.D. (Ph.D Jabatan Fizik), Effect of Ag<sub>2</sub>O on Optical and Elastic Properties of Nd-Doped Zinc Tellurite Glass System, main advisor AP Dr. Halimah Mohamed Kamari - graduated 2019
- Nurhayati Mohd Nor, Ph.D (Ph.D Jabatan Fizik), Optical and Elastic Properties of (100-X)(SiO<sub>2</sub>. TeO<sub>2</sub>.B<sub>2</sub>O<sub>3</sub>).X(V2o5) Glass System, main advisor AP Dr. Halimah Mohamed Kamari - starting 2016
- 6. Zaitila I., Ph.D. (Ph.D Jabatan Fizik), Optical Properties of Silica Borotellurite Glass Doped with Manganese, main advisor AP Dr. Halimah Mohamed Kamari graduated 2019
- 7. Mohd Faudzi Umar, Ph.D (Mathematical Physics & Engineering) INSPEM, On Non-commutative Quantum Mechanics, main advisor AP Dr. Hishamuddin Zainuddin graduated 2021

# MSc.

- 1. Amirul Fakhruddin bin Jamaludin, MSc (Applied Physics), main supervisor Muhammad Khalis bin Abdul Karim starting Sept 2020
- 2. Muhammad Aqwa, MSc. (Mathematical Physics & Engineering) INSPEM, On complex networks, main advisor Assoc. Prof. Dr. Hishamuddin Zainuddin - thesis completed 2023
- 3. Nurul Nasha, MSc. (Mathematical Physics & Engineering) INSPEM, On complex networks, *main advisor Dr. Chan Kar Tim* starting Feb 2017 (withdrew from program)
- 4. J.Y.S. Liang, MSc. (Mathematical Physics & Engineering) INSPEM, On complex networks, main advisor Dr. Chan Kar Tim graduated 2022
- 5. Siti Aqilah Muhamad Rasat, MSc. (Mathematical Physics & Engineering) INSPEM, On Categorial Quantum Mechanics, main advisor AP Dr. Hishamuddin Zainuddin graduated 2021

# **INDUSTRIAL TRAINING EVALUATOR**

#### Semester 2, 2021/22

- 1. Agensi Nuklear Malaysia (Examiner), Muhammad Luqman Arif Mohamad (196696)
- 2. Jeonbuk National University, Rep. of Korea (Examiner), Nur Aqilah Shaari (196715)
- 3. Dr. Gadget UPM (Examiner), Muhammad Haikal Mohd Zuli (198040)

Semester 2, 2020/21

BAHAGIAN KAWALSELIA RADIASI PERUBATAN KEMENTERIAN KESIHATAN MALAYSIA (Examiner)

- 1. SITI NOORUL NADHIRAH ZAMRUS, (192641)
- 2. ALEESYA SYAQIRA JOESRY SYAHIWAN, (192796)

#### Semester 2, 2019/20

- 1. Dr. Gadget UPM (Examiner), Syahrul Aminuddin Ridzuan, (187730)
- 2. KK Metal Processing Sdn. Bhd., Anis Sofie Osman, (186713)

3. META Research Sdn. Bhd., Lam Chee Yuen, (187009)

#### Semester 2, 2018/19

- 1. SEMS Services Sdn. Bhd (Examiner), Nurizaty Azmina Aminnuddin, (182840)
- 2. Elite Scientific Instruments (Examiner), Siti Nur Asyiqin Harun, (184397)

#### Semester 2, 2016/17

- Seremban Engineering Berhad, Kaw. Perindustrian Senawang
  - 1. Ng Kang Wei, (179982)
- Exis Tech Sdn. Bhd.
  - 1. Pah Mei Chen, (179531)
- Balai Cerap Teluk Kemang, Port DIckson
  - 1. Nurul Hafiza Ahmad Tajudin, (175145)
  - 2. Mardhiah Abd. Ghani, (177154)
  - 3. Siti Nabilah Ahmad, (175437)
  - 4. Latipah Redzuan, (173572)
  - 5. Norfaizah Zulkifli, (177637)

#### Semester 2, 2015/16

- Balai Cerap Teluk Kemang, Port Dickson
  - 1. Nadzri Izzbullah Jeperi, (169201)
  - 2. Syanaz Shazmira Zahidi (175571)
- ON SEMICONDUCTOR SCG MALAYSIA SDN. BHD, Kaw. Perindustrian Senawang
  - 1. Nurfaziera Rahim, (174154)
  - 2. Siratol Azrina Mahisar (174004)

#### Semester 2, 2014/15

- SIGN TECH SDN BHD, Sri Serdang, Selangor
  - 1. Mohammad Khairi Abdul Ghani, (162948)
  - 2. Nur Faiezah Shafie (163682)

#### Supervision Teaching and Internship Trainin (Latihan Mengajar, LMI)

- SMK Bandar Seri Putra, Fizik, Semester 2 2022/2023, Mohamad Farid Rozali (203450)
- SMK Bandar Seri Putra, Fizik, Semester 2 2022/2023, Amirul Amin Amran (203450)
- SMK Bandar Seri Putra, Mathematik/Fizik (subjek tumpuan kedua) Semester 2 2021/2022, Asmaa Zafirah Kamaluzaman (196778)
- SMK Bandar Baru Bangi, Fizik/Matematik, May/June 2018

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# Supervision Pengalaman Awal Di Sekolah, PALS)

- SMKA Naim Lilbanat, Kelantan BSDP Fizik, Semester 1 2023/2024, xxx (xxx)
- SMKA Naim Lilbanat, Kelantan BSDP Fizik, Semester 1 2022/2023, Nur Adriana Amalin Akmar (2111231)
- Sekolah Menengah Kebangsaan Seri Lalang, Johor BSDP Fizik, Semester 1 2022/2023, Muhammad Fauzi Md Hairi (203111)

## FIELD OF SPECIALIZATION

Mathematical Physics, quantum theory, group theory in physics

# CURRENT RESEARCH INTEREST

Topic in mathematical physics are very broad. My current interest is on non-commutative quantum mechanics (NCQM) model. In particular, we explore the study of generalized Hermite polynomials arise in NCQM model (two dimension) which include analysis of polynomials properties. Other closed topic will involve coherent states and their associated polynomials. Other interest area are group theory in particular Lie groups and application of generalized polynomials to quantum optics.

To summarize

- 1. Non-commutative quantum mechanics
- 2. Quantum Theory
- 3. Factorization method for exactly solvable potentials
- 4. Biorthogonal polynomials
- 5. Mathematical physics
- 6. Quantum information Science

# SCIENTIFIC INVOLVEMENT

- 1. Council Member, Institut Fizik Malaysia (2023 2025)
- 2. Research Associate, Laboratory of Mathematical and Computational Physics, Institute for Mathematical Research, INSPEM, UPM (2022-2024)
- 3. Academics Curriculum Coordinator, Department of Physics, Faculty of Science, UPM (2022-2024)
- 4. Research Associate, Laboratory of Mathematical and Computational Physics, Institute for Mathematical Research, INSPEM, UPM (2017-2019)
- 5. Honorary Editorial Board Member (2017-2019), Malaysian Journal of Mathematical Sciences (MJMS)
- 6. Academics Curriculum Committee Member, Department of Physics, Faculty of Science, UPM (2017-2022)

# SCIENTIFIC PUBLICATIONS

# Main/Senior Author

- 1. Ahmad H., Nurisya M.S., Sharifah K.S.H. and Hishamuddin Z. (2024). Canonical group quantization on Riemann sphere and its angular momentum operators, (under review in JPhysA)
- 2. Ahmad H., Nurisya M.S., Sharifah K.S.H. and Hishamuddin Z.(2024). Quantum States on Fibre of Vector Bundle From Blow-Up Perspectives, Jurnal Fizik Malaysia 45 (1), 10079-10087
- 3. Ahmad Aqwa Rosli and Nurisya Mohd Shah (2024). Constructing quantum angular momentum  $L_3$  in specific direction by using U(1) group, Malaysian Journal of Science (accepted copy editing status)
- M. T. Selvam, M. S. Nurisya and Sh.K. Said Husain (2023). Pre-Schmidt Mode parameters in Quantum Entanglement, ASM Sc. J., 18. https://doi.org/10.32802/asmscj.2023.1355
- M.Y.Tan, M.S. Nurisya, H. Zainuddin (2023). Parameter Space of Morse Oscillator, Jurnal Fizik Malaysia 44 (1), 10001-10012
- M.Y.Tan, M.S. Nurisya, H. Zainuddin (2023). On Green factorization and supersymmetry, -Physica Scripta, Vol. 98:0105027. https://doi.org/10.1088/1402-4896/acacd0
- M.N.N.M. Rusli, M.S. Nurisya, H. Zainuddin, M.F. Umar and A. Jellal (2022). Gauge Invariant Degeneracies and Rotational Symmetry Eigenstates in Noncommutative Plane, Journal of Holography Applications in Physics, Vol 2: 11-36. doi 10.22128/jhap.2022.584.1032
- 8. M.N.N.M. Rusli, **Nurisya M.S.**, H. Zainuddin, Chan K.T. (2022). Analytical Spectrum Isomorphism of Noncommutative Harmonic Oscillator and Charged Particle in Magnetic Field, Jurnal Fizik Malaysia, Vol. 43:10043-10054
- 9. Chew Kang Ying, Nurisya Mohd Shah & Chan Kar Tim, (2022), Algebraic representation of three qubit quantum circuit problems, Malaysian Journal of Mathematical Sciences, 16(3): 531–554.
- T Shelawati, Nurisya M.S., A Jellal (2021). Confining type-II spherical core-shell quantum dot heterostructures with narrow and wide band gaps - arXiv preprint arXiv:2111.14378 [cond-mat.meshall] - under revision. https://doi.org/10.48550/arXiv.2111.14378
- Nadhira Abd. Haris, Nurisya M. Shah, & Chan Kar Tim (2020), Morse Potential in Noncommutative Quantum Mechanics Framework, Advances in Mathematics: Scientific Journal 9, no.12, 10895–10902
- Shelawati Tiansin, Nurisya M.S., C. Kar Tim & Mazliana A.K. (2019). Effects of Step-Potential on Confinement Strength of Strain-Induced Type-I Core-shell Quantum Dots, Superlattices and Microstructures 131, 95-103.
- Nadhira Abd. Haris, Nurisya M. Shah, Chan K. Tim & H. Zainuddin (2019), A Note on Deformed Ladder Operators for Noncommutative Morse Oscillator. https://doi.org/10.48550/arXiv.1905.05183
- 14. Nurisya M. Shah, Noncommutative Landau problem and shifted energy levels, pre-print https://doi.org/10.48550/arXiv.1806.11144
- 15. Nurisya M. Shah, Hishamuddin Zainuddin & Chan Kar Tim, Group Theoretical Properties of Certain Bilinear Combinations of the Non-Commutative Ladder Operators, 37th International Conference on Quantum Probability and Related Topics, 22-26 August, (2016) - Extended abstract\*\*
- 16. Nurisya M. Shah, H. Zainuddin & Chan Kar Tim, Some Associated Lie Group & Deformed Lie Algebra Arise in NCQM Model, Fundamental Science Congress, FSC (2016) Extended absract\*\*

- 17. Nurisya M. Shah, H. Zainuddin & Chan Kar Tim A Note on Laguerre Polynomials Associated to Noncommutative Morse Oscillator Model, 5th International Conference on Solid State Science & Technology, ICSSST (2015) - Extended abstract<sup>\*\*</sup>.
- 18. Nurisya M. Shah, Some families of complex Hermite polynomials arise in NCQM model in two dimensions, Fundamental Science Congress, FSC (2015) absract\*\*
- 19. Nurisya M. Shah & Choong Park Shen, *The geometry of generalized deformed complex Hermite polynomials*, International Conference on Research and Educational in Mathematics 2015 (ICREM7) - *Extended abstract*\*\*.
- S.Twareque Ali, Mourad E.H. Ismail & Nurisya M. Shah, Deformed complex Hermite polynomials, submitted to AMS proceeding (2014). Concordia University ppt. 2014. https://doi.org/10.48550/arXiv.1410.3908
- F. Balogh, Nurisya M. Shah & S.T. Ali, On Some Families of Complex Hermite Polynomials and their Applications to Physics, Operator Theory: Advances and Applications, Vol. 247, 157-171, 2015 Springer International Publishing.
- 22. Nurisya Mohd Shah Some Families of Complex Biorthogonal Polynomials in a Model of Noncommutative Quantum Mechanics, Ph.D Thesis 2014/10, Concordia University.

# **Co-Author**

- Mohd Faudzi Umar, Nurisya Mohd Shah, (2023). Newton's Second Law on Positive Real Line R<sub>+</sub>, Journal of Science and Mathematics Letters, 11: 158-162.
- 2. Ahmed Bouhlal, Ahmed Jellal, and Nurisya Mohd Shah, (2023). Zero-energy states in graphene quantum dot with wedge disclination, Solid State Communications, 115269. https://doi.org/10.1016/j.ssc.2023.115269
- Muhamad, L.H., A Karim, M.K., Chew, M.T., Kechik, M.M.A, Shah, N.M., Ibahim, M.J., Saeed, I.M. (2023). Atmospheric dispersion and dose assessment of 137Cs and 1311 from hypothetical incidents of nuclear power plant in Southeast Asia, Radiation Physics and Chemistry, 208:110941
- Mohd Azizul Zainal, Chan Kar Tim, Hishamuddin Zainuddin, Nurisya Mohd Shah & Raymond Ooi Chong Heng (2023). First Principles Study of Toxic Gas Molecules Adsorption on Group IVA (C,Si,Ge) 2-Dimensional Materials, Sains Malaysiana 52(2)(2023): 625-639
- Umair Abdul Halim1, Chan Kar Tim, Nurisya Mohd Shah, (2023). Chaos In 2D Bohmian Trajectories of Commensurate Harmonics Oscillators, Journal of Advanced Research in Applied Sciences and Engineering Technology 29, Issue 2, 195-203.
- M. A. A. Ahmed, H. Zainuddin, N. M. Shah (2022). Real-time thermal self-energies: In the variational bases and spaces, Results in Physics 39: 105691
- 7. M. A. A. Ahmed, H. Zainuddin, N. M. Shah and Madjid Lakhdar Hamou Ladrem (2022). Real time thermal photon-photon interactions in the mixed space, International Journal of Modern Physics A Vol. 37, No. 5 2250008 (23 pages)
- M. A. A. Ahmed, H. Zainuddin and N. M. Shah, (2022). Thermal Propagator of the Boson and Fermion Fields, Jurnal Fizik Malaysia, Vol. 43:10036-10042
- 9. Nurhayati Mohd Nor, Halimah Mohamed Kamari, Amirah Abdul Latif, Nurisya Mohd Shah, Nazirul Nazrin Shahrol Nizam, Nur Nabihah Yusof, Imed Boukhris, Imen Kebaili (2021). *Physical,* structural and optical characterization of silica-borotellurite glasses containing vanadium and nickel ions, Physica B: Condensed Matter, https://doi.org/10.1016/j.physb.2021.413553

- MAB Hamid, KT Chan, CHR Ooi, H Zainuddin, NM Shah, NNS Nidzam (2021). Structural stability and electronic properties of graphene/germanene heterobilayer, Results in Physics 28, 104545
- 11. M. A. A. Ahmed, H. Zainuddin, N. M. Shah and S. K. Chen *Thermal longitudinal photon interaction in mixed space*, AIP Conference Proceedings 2319, 100003 (2021).
- 12. NM Nor, HM Kamari, AA Latif, **NM Shah**, *Elastic Properties of Vanadium Doped Silica-Borotellurite Glasses*, Solid State Phenomena 307, 321-326 (2020).
- Ganesh Subramaniam, Hishamuddin Zainuddin & Nurisya Mohd Shah, Jurnal Fizik Malaysia, (2019), 40 Issue 1 (2019) pgs 10001-10007.
- J.Y.S. Liang, K.T. Chan, H. Zainuddin & N.M. Shah, (2018) Extracting Network Structure for International and Malaysia Website via Random Walk, ASM Sc. J., 12. https://doi.org/10.32802/asmscj.2019.400
- 15. J.Y.S. Liang, K.T. Chan, H. Zainuddin & N.M. Shah, (2018) Network Structure for Global and Local Website (2018) submitted to Physica A
- N.N.A.S. Kamal, K. T. Chan, & N.M.Shah, (2019) Dynamical process on growing geometrical network based on modular group, ASM Sc. J., 12, Special Issue 1, 2019 for IQRAC2018, 276-284.
- M. A. A. Ahmed, S. Cherif, M. Ladrem, H. Zainuddin, & N. M. Shah, Effect of Colorlessness Condition on Phase Transition from Hadronic Gas to Partonic Plasma, Jurnal Fizik Malaysia, (2018), 39:30079–30087.
- Mohd Faudzi Umar, Nurisya Mohd Shah & Hishamuddin Zainuddin, Two Dimensional Plane, Modified Symplectic Structure and Quantization, Jurnal Fizik Malaysia, (2018), 39:30022–30026.
- Zaitizila I., Halimah M.K., Muhammad F.D. & Nurisya M.S., Optical Properties of Silica Borotellurite Glass Doped with Manganese Oxide, Trans. Tech. Publisher, International (2017) 18-22.
- 20. Zaitizila I., Halimah M.K., Muhammad F.D. & Nurisya M.S., Effect of Heat Treatment on Structural Properties of Silica Borotellurite Glasses Containing MnO, Journal of Physics Conference Series 1083(1):012001
- 21. N.N.A. S. Kamal, K. T. Chan, N.M.Shah and H. Zainuddin, Formulation of First Passage Time Problem on Growing Geometrical Network, FSC 2017 Chapter in Book. accepted
- 22. Abdulbaset A.A, Halimah Mohamed Kamari, Chan K. T, Nurisya Mohd Shah, S.H. Alazoumi, Umar S.A. and Azlan Muhammad Noorazlan, *Effect of Neodymium Nanoparticles On Elastic Properties Of Zinc Tellurite Glass System*, Advances in Materials Science and Engineering, Vol. 2017, Article ID 6790635, 7 pages (2017)
- 23. Hishamuddin Zainuddin, Chan Kar Tim, Nor Syazana Shamsuddin & Nurisya Mohd Shah, Quantum Bound States on Some Hyperbolic Surfaces, Journal of Physics Conference Series 795(1)-:012002 (2017)
- 24. Chan Kar Tim, Hishamuddin Zainuddin & Nurisya M. Shah, A Study of Complex Network Using Hyperbolic Triangle Group, Fundamental Science Congress, FSC (2016) - Extended absract
- 25. Chan Kar Tim, Hishamuddin Zainuddin & Nurisya M. Shah, Random walks on growing geometrical network based on Fuchsian group, 37th International Conference on Quantum Probability and Related Topics, 22-26 August, (2016) - Extended abstract
- Ahmed Mohamed Siddig, A., Shah, N.M., Zainuddin, H., Maass cusp forms on singly punctured two-torus, AIP Conference Proceedings 1150, pp. 107-115 (2009).

# Before year 2008

- 1. Hishamuddin Zainuddin, Toh Sing Poh, Nurisya Mohd Shah, Mazlinda Zainy, Zuriati Zulkarnain, Jumiah Hassan, Zainul Abidin Hassan, Journal of Fundamental Sciences 3, 2007.
- 2. Nurisya Mohd Shah, Hishamuddin Zainuddin & Zainul Abidin Hassan, (6-7 December 2006), National Physics Conference 2006 (PERFIK 2006), The Palace of the Golden Horses, Tessellation Structure of Singly Punctured Two-Torus and Triply Punctured Two-Sphere.
- 3. Nurisya Mohd Shah & Hishamuddin Zainuddin, (20-21 May 2003), Conference of Advances and Theoretical Sciences 2003 (CATS2003), Advanced Technology Congress 2003 (ATC2003), Putrajaya Marriot Hotel, Putrajaya entitled Commutator Relations of Local Operators Using Embedded Coordinates of  $S^2$  and  $H^2$ .
- 4. Nurisya Mohd Shah, Hishamuddin Zainuddin & Zainul Abidin Hassan, Maass cusp forms for singly punctured two-torus and triply punctured two-sphere. Proceeding of Seminar Sains 2007 and 9th Putra Seminar.
- 5. Nurisya Mohd Shah & Hishamuddin Zainuddin, (6-8 December 2005), Conference of International Advances and Theoretical Sciences 2005 (CATS2005), International Advanced Technology Congress 2005 (ATCi 2005), Putrajaya Marriot Hotel, Putrajaya, Towards Quantum Mechanical Scattering States on Triply Punctured Two Sphere.
- 6. H. Zainuddin, A. Bouketir, A.A.M. Siddig, F.P. Zen & **N.M. Shah**, Group-Theoretic Quantization on Triply Punctured Two-Sphere.
- 7. Nurisya Mohd Shah, Master Thesis entitled Energy Eigenequation Expansion for A Particle on Singly Punctured Two-Torus and Triply Punctured Two-Sphere: Universiti Putra Malaysia, UPM (2008).

# OTHER PUBLICATIONS

# Copyright

1. Copyright LY2023w02344 "Biorthogonal Families of Complex Hermite Polynomials" (*Literacy*), 2023. Nurisya Mohd Shah & Syahirah Abu Bakar.

# Chapter in Book

- 1. Nurisya M. Shah & Siti Rahimah Sarnua, *Interactive Quantum Harmonic Oscillator*, Emerging Themes in Fundamental & Applied Sciences 2018, Chapter in Book (eISBN-978-967-334-813-5).
- F. Balogh, Nurisya M. Shah & S.T. Ali, On Some Families of Complex Hermite Polynomials and their Applications to Physics, Operator Theory: Advances and Applications, Vol. 247, 157-171, 2015 Springer International Publishing.

# Report/Bulletin/News

- 1. Nurisya Mohd Shah. News at www.majalahsains.com (Mei 3, 2024). Mesyuarat Negara ASEAN dalam Bidang Sains dan Teknologi Kuantum -
- 2. Nurisya Mohd Shah dan Muhammad Khalis Abdul Karim. News at www.majalahsains.com (Januari 17, 2024). Memorandum Persefahaman Industri-Akademia Memacu Industri Teknologi Pengimejan Perubatan di Jabatan Fizik UPM
- 3. Nurisya Mohd Shah. Exploring Quantum Circuit Complexity with Lie Groups and Riemannian Geometry, Newsletter (e-Science Putra), Issue 13: September Disember 2023.

- 4. Nurisya Mohd Shah. News at www.fizikkini.com (July 28, 2023). Mesyuarat Pertama Quantum Information Meetup 2023 di Xiamen University Malaysia (XMU)
- 5. Nurisya Mohd Shah, Ahmad Hazazi Ahamad Sumadi, Mohd Faudzi Umar, M.A.A. Ahmed, Ganesh Subramaniam & Nor Syazana Shamsuddin *Workshop on Topological Phase Transitions and New Developments*, Asia Pacific Physical Societies Newsletter, Oct 2017.
- Chen Soo Kien, Chan Kar Tim, Nurisya Mohd Shah, Josephine Liew Ying Chee & Farah Diana Muhammad, *Department of Physics, UPM*, Association Asia Pacific of Physical Society Bulletin, OCT 2017.
- Nurisya Mohd Shah, Ahmad Hazazi Ahamad Sumadi, Mohd Faudzi Umar, M.A.A. Ahmed, Ganesh Subramaniam & Nor Syazana Shamsuddin Workshop on Topological Phase Transitions and New Developments (5-8 June 2017), Institute of Advanced Studies Newsletter, Issue 21, August 2017.
- Nurisya M. Shah, Chan Kar Tim & Hishamuddin Zainuddin, The Role of Hermite Polynomials in Physics, - BULETIN PENYELIDIKAN INSPEM - MATHDIGEST, pg 12-16 (2017), Hardcopy March 2018.

# Popular writing

- 1. Nurisya Mohd Shah, *Matriks bukan sekadar susunan nombor*, Majalah Dewan KOSMIK eJendela - popular science article (published Dec 2021).
- 2. Nurisya Mohd Shah, Seni dan Keindahan Simetri dalam Sains, Majalah Dewan KOSMIK popular science article (published June Edition 2020).
- 3. Nurisya Mohd Shah, *Jalur Mobius Objek Geometri*, Majalah Dewan KOSMIK popular science article (published January Edition 2019).
- 4. Nurisya Mohd Shah, Ulasan Buku *Birds & Frogs*, compilation of selected papers by Freeman Dyson terbitan World Scientific Publishing 2015. Majalah Sains Ed. 2. (2018). Also available online (4th June 2018) at https://www.majalahsains.com/ulasan-buku-birds-and-frogs-selected-papers-of-freeman-dyson-1990-2014/
- 5. Azhar Abu Talib & Nurisya Mohd Shah, Albert Einstein: Dari Kerani Menjadi Saintis Agung, Majalah Sains Edisi Pertama 2018.
- 6. Nurisya Mohd Shah, *Geometri dalam Jadual Berkala*, Majalah Dewan KOSMIK popular science article (published April Edition 2018).
- 7. Nurisya Mohd Shah, Nombor Fibonacci pada Alam, Majalah Dewan KOSMIK popular science article (published May Edition 2017)-Winner PERSAMA's 2018 consolation prize
- 8. Nurisya Mohd Shah, Langit Berwarna Biru?, Majalah Dewan KOSMIK. popular science article (published June Edition, 2016).
- 9. Nurisya Mohd Shah, Geometri dalam kehidupan, Majalah Dewan KOSMIK. popular science article (published May Edition, 2016) Winner PERSAMA's 2017 consolation prize
- 10. Nurisya Mohd Shah, co-author Sains-lah: Catatan Sainstis Muda, entitle "Ada apa dengan fizik teori", SIMPTOMATIK PRESS, ISBN 978-967-2011-13-2 (April 2016). short story
- 11. Nurisya Mohd Shah. Article at www.majalahsains.com (Januari 2, 2010). Gerard't Hooft: Menyusun Teka-teki Alam Semesta Dengan Fizik Partikel
- 12. Azhar Abu Talib & Nurisya Mohd Shah, Albert Einstein: Dari Kerani Menjadi Saintis Agung, sisipan Majalah ESTIDOTMY, Mei 2005 sempena World Year of Physics.

# Module

- Hishamuddin Zainuddin, Chan Kar Tim, Nurisya M. Shah, Choong Pak Shen, Ganesh Subramaniam, Ahmad Hazazi Ahmad Sumadi, Ting Woei Luen & Nor Syazana Shamsuddin, Shadow of Geometry in the Physical World, Program Kem Sains Matematik bersama SERATAS. (2018) (Revised Module)
- Hishamuddin Zainuddin, Chan Kar Tim, Nurisya M. Shah, Choong Pak Shen, Ganesh Subramaniam, Ahmad Hazazi Ahmad Sumadi, Ting Woei Luen & Nor Syazana Shamsuddin, Shadow of Geometry in the Physical World, Program Mentor Mentee SMK Lembah Klang. (2018) (Revised Module)
- 3. Nurisya Mohd Shah, *Mysterious Marbles Problem*, Module prepared for National Science Challenge 2016 organized by Academy Science Malaysia, ASM. (2016)
- 4. Hishamuddin Zainuddin, Chan Kar Tim, **Nurisya M. Shah**, Choong Pak Shen, Ganesh Subramaniam, Ahmad Hazazi Ahmad Sumadi, Ting Woei Luen & Nor Syazana Shamsuddin, *Shadow* of Geometry in the Physical World, Program Kem Sains Matematik bersama SERATAS. (2016)
- 5. Hishamuddin Zainuddin, Chan Kar Tim, **Nurisya M. Shah**, Choong Pak Shen, Ganesh Subramaniam, Ahmad Hazazi Ahmad Sumadi, Ting Woei Luen & Nor Syazana Shamsuddin, Program Kem Sains Matematik bersama SERATAS. (2015)

# **Research Proposal**

## Main Researcher

- 1. 2023 FRGS "Construction of Green factorization and supersymmetric quantum anharmonic potential with their coherent states" (unsuccessful)
- 2. 2015 DIER ProGRANT, "Generalized polynomials associated to Barut Girardello Coherent States", submitted Dec, 2015 (unsuccessful)

# Member/Co-Researcher

- 1. 2017 FRGS/1/2017/STG02/UPM/02/3, "Symplectic Geometrical and Topological Aspects of Phase Space Quantum Mechanics" (unsuccessful)
- 2. 2018 FRGS/1/2018/STG02/UPM/02/3, "Complex Projective Geometry of Quantum Entanglement, Quantum Contextuality & Quantum Resources" - submitted February 2018
- 3. 2018 FRGS/1/2018/STG02/UPM/02/3, "First-Principles Study on Structural and Electronic Properties of Graphene/Silicene Superlattice with Adsorbed Transition Metals" submitted February 2018 (unsuccessful)

# <u>Grants</u>

# Grant Leader

- 1. Geran Putra Fast Track, 1 Nov 2023 31 Oct 2026. Construction of Green factorization and supersymmetric quantum anharmonic potential with their coherent states. **MYR 50,000**. GP/FAST TRACK 2023/0855/NURISYA BT MOHD SHAH
- 2. Air Force Office of Scientific Research, AFORS (AAORD) Sept 2022- Setp 2025, A Proper Study of Group theoretical methods in Quantum Error Correction, **USD 60,000**
- 3. ERCE Grant from European Mathematical Society (EMS) 2021 EUR 2,000.
- 4. FRGS/1/2018/STG02/UPM/02/10 amount of **MYR 57,000** entitle "Refining Energy Band Structures and Strain Effect on Shell Growth of Type-I core/shell Colloidal Quantum Dots Heterostructures" commence on 1st January 2019 31st Sept 2021.
- 5. GP-IPS/2018/9645700 **MYR 25,000** entitle "Deformed Ladder Operator for Two-dimensional Morse potential" commence on 2 April 2018 2 April 2020.
- GP-IPM/2016/9473100 amount of MYR 41,000 entitle "Noncommutative Morse Potential in two dimensions" commence on Feb 15, 2016 - Feb 15, 2018.

# Member/Co-Researcher

- 1. GP-IPS/2022/ MYR20,000 entitle "Topological Analysis on Public Transportation in Klang Valley: A Complex Network Approach " (co-researcher/member)
- FRGS/1/2020/STG07/UPM/02/2 amount of MYR 93,600 entitle "Density Functional Theory Study For Structural, Electronic, Transport and Optical Properties of Heterobilayer From Two Dimensional Materials" commence on 1 Nov 2021 - 31 Oct 2023. (co-researcher/member)
- FRGS/1/2016/STG02/UPM/02/1 amount of MYR 90,000 entitle "Geometrical Aspects of Quantum Entanglement and Uncertainty Principle" commence on 31 Aug 2021 - 31 May 2022. (coresearcher/member)

- 4. FRGS/1/2016/STG02/UPM/02/1 amount of MYR 69,200 entitle "Random Walks on growing geometrical network based on Fuchsian group" commence on 15 Aug 2016 14 Aug 2018. (corresearcher/member)
- 5. GP-IPS/2018/ MYR25,000 entitle "Mean First-Passage Time For Random Walks On Growing Geometrical Network " (co-researcher/member)

# AWARDS/SPONSORSHIP/RECOGNITION

- 1. April 2024 Finalist Anugerah Fellowship Naib Canselor Kategori Pengajaran (AFNC- KP)
- 2. Nov 2023 IPICTL 2023 Silver Award. Poster competition, Fostering Confidence and Interest in Mathematical Techniques Among Physics Students
- 3. Sept 2023 Anugerah PERSAMA 2023. Hadiah Sanjungan Kategori Makalah Ilmiah entitled Algebraic representation of three qubit quantum circuit problem
- 4. July 2023 Anugerah Perkhidmatan Cemerlang 2023
- 5. Sept 2020 Gold Winner, v-MTC 4.0 2020 (Materials Science Challenge), organized by MASS Chapter UPM.
- 6. Nov 2018 ANUGERAH SANJUGAN PERSAMA 2018, Kategori Rencara Popular, "Nombor Fibonacci Pada Alam", Edisi Mei 2017 Dewan Kosmik. (Persatuan Sains Matematik Malaysia, PERSAMA)
- 7. Dec 2017 Travel Grant to attend Merdeka Meeting 2017, UTM from Akademi Sains Malaysia, (ASM).
- 8. Aug 2017 ANUGERAH SANJUGAN PERSAMA 2017, Kategori Rencara Popular, "Geometri Dalam Kehidupan", Edisi Mei 2016 Dewan Kosmik. (Persatuan Sains Matematik Malaysia, PER-SAMA)
- 9. 2016 Calon Anugerah Adi Pengajar Muda, Fakulti Sains di Majlis Apresiasi Sains 2016.
- 10. 2008 Skim Latihan Akademik Institute Tinggi, SLAI oleh Kementerian Pengajian Tinggi, Malaysia.
- 11. 2005 UPM Master of Science Scholarship.
- 12. 2004 Participation of the Lindau Meeting with Nobel Laureates in Physics, Akademi Sains Malaysia, ASM Sponsorship.

# JOURNAL REFEREE/REVIEWER

{Date}{Title of Manuscript}{Name of Journal}{Publisher}

- 1. August 2023, "Unification of spatiotemporal quantum formalisms: mapping between process and pseudo-density matrices via multiple-time states", New Journal of Physics, IOP Publishing
- 2. August 2023, "Deep Learning Symmtries and Their Lie Groups, Algebra and Subalgebra from First Principle", Machine Learning: Science and Technology, IOP Publishing
- 3. Jan 2023, "Time-Dependent Perturbation Theory for Quantum Mechanical Systems", ASM Science Journal, Akademi Sains Malaysia Publisher
- 4. Jan 2023, "Density-potential inversion from Moreau-Yosida regularization", Electronic Structure, IOP Publishing
- 5. July 2022, On the solution of one-dimensional heat equation with higher-order non-central finite difference method of lines, ASM Science Journal, Akademi Sains Malaysia Publisher

- 6. Aug 2021, "THE GENERALIZED GEOMETRIC UNCERTAINTY PRINCIPLE FOR SPIN 12 SYSTEM", Advances in Mathematics: Scientific Journal
- 7. Aug 2021, "THE DYNAMICAL EVOLUTION OF GEOMETRIC UNCERTAINTY PRINCIPLE FOR SPIN 12 SYSTEM", Advances in Mathematics: Scientific Journal.
- 8. July 2021, First and Second-Order Energy Eigenvalues of One–Dimensional (1-D) Quantum Harmonic and Anharmonic Oscillator with Linear, Quadratic, Cubic and Polynomial Perturbation Potential, ASM Science Journal, Akademi Sains Malaysia Publisher
- 9. Feb 2019, "Multiple Branch Structure of One-Monopole plus Half-Monopole in Georgi-Glashow Model", Jurnal Fizik Malaysia (JFM), Institut Fizik Malaysia.
- 10. July 2018, "Wavelet Denoising as Signal Feature-Dependent Kernel Convolution", ASM Science Journal, Akademi Sains Malaysia.
- 11. Feb 2018, "Branching Behavior of the Dyonic Multi-Monopole and Multi-Half monopole in the SU(2) Yang-Mills-Higgs Theory", Jurnal Fizik Malaysia (JFM), Institut Fizik Malaysia.
- 12. Aug 2016, Journal of Solid State Science & Technology (JSSST).

# COLLOQUIUM/CONFERENCE/SEMINAR/TALK/WORKSHOP

# International

- 1. Quantum ASEAN Meeting 25-26 April 2024, Avani Sukhumvit Hotel, Bangkok, Thailand. Strategizing Quantum Science and Technology in the ASEAN context (participant)
- 2. EQuaLS2022 and The World Quantum Day ERCE event (European Mathematical Society (EMS) grant), 2-6th Nov 2020, (Chairman)
- 3. International Fundamental Science Congress 2021 (iFSC), 23-24th Oct 2021, Zoom Meeting (participant)
- 4. EQuaLS2020 ICTP Physics Without Frontiers, 2-6th Nov 2020, (Chairperson)
- 5. 2nd Symposium on Multidisciplinary Science 2020 (SMS2020) 12th Aug 2020 Invited Speaker
- 6. International Fundamental Science Congress 2019 (iFSC2019), 30-31st Oct 2019, Palm Garden Hotel, IOI Resort City, Selangor (**Poster presenter**)
- 7. International Symposium on Quantum and Complex Sciences 2019 (QuantPlexity), 19-20th Sept 2019, INSPEM, UPM, Selangor (**Invited Speaker**)
- 8. International Fundamental Science Congress 2018 (iFSC), 23-24th Oct 2018, RHR Hotel @UNITEN, Bangi, Selangor (**Oral presenter**)
- 9. ASEAN Federation of Physics Societies & Workshop on Frontier of Physics, NTU, 29-30 August, 2017 (Participant)
- 10. Workshop on Topological Phase Transition and New Developments, Nanyang Executive Centre (NEC), Nanyang Technology University (NTU), 5-8 June, 2017 (**Participant**)
- 11. 4th International Workshop on Nonlinear and Modern Mathematical Physics (NMMP-2017), Dorsett Putrajaya, 4-8 May, 2017 (participant)
- 12. Webinar Training Tutorial Hands-on Start to Wolfram Mathematica, 19 April, 2017 (Participant)
- 37th International Conference on Quantum Probability and Related Topics, 22-26 August, 2016 IIUM Kuantan (poster presenter)
- 14. 5th International Conference on Solid State Science & Technology 2015, ICSSST2015, Langkawi, Kedah 13-15th December 2015 "A Note on Laguerre Polynomials Associated to Noncommutative Morse Oscillator Model" (**poster presenter, Chairperson Parallel Session**)
- 15. International Conference on Research and Educational Mathematics 2015 (ICREM7), 25-27 August 2015, Kuala Lumpur, (oral presenter, Chairperson Parallel Session) "The geometry of deformed generalized complex Hermite polynomials"
- 16. Conference of Advances and Theoretical Sciences 2003 (CATS2005) in International Advance Technology Congress (ATCi 2005), "Towards quantum mechanical scattering states on triply punctured two sphere" (**Poster presenter**)

# Local

- 1. Bengkel Transformasi Tesis kepada Buku, anjuran Penerbit UPM, 9-10 Mei 2024 - ${\it Panel}$
- 2. Forum Quantum Computing in Cybersecurity, Faculty of Computing, UTM, Skudai Johor, 11 Januari 2024 **Panel**
- 3. ELSEVIER AUTHOR WORKSHOP, The Ins. and Outs of Scholarly Publishing . Finding the right journal for your manuscript & the peer-review process, 9 August 2023 Participant

- 4. NATIONAL PHYSICS UNDERGRADUATE PROJECT CONFERENCE, 14th & 15th October 2023, Xiamen University Malaysia *Panel Judge, Theoretical Physics*
- 5. Seminar Pendidikan Fizik Kebangsaan, 26 September 2023, (Webex)-Speaker
- 6. Quantum Information Meetup 2023, 24-25 July 2023, Xiamen University Malaysia Speaker
- 7. INNOCREATIVE TECHNOLOGY CHALLENGE (ICTC) 1.0 22 Jun 2023, anjuran MASS Chapter UPM *Panel Judge*
- 8. Persidangan Fizik Kebangsaan (PERFIK 2022), 6-8th December 2022 Participant
- 9. Pertandingan Inovasi STEM Melalui Penceritaan bagi Kategori Sekolah Menengah, 1 Jun hingga 31 Ogos 2022 anjuran Dewan Bahasa dan Pustaka (DBP) *panel judge*
- 10. BENGKEL INTERAKSI 1 BERSAMA PANEL PENILAI BAHARU AUDIT PROGRAM, 5 April 2022 *participant*
- 11. FYP Seminar, "How to write a good dissertation", Semester 2 2021/2022 (FYP A) 15th June 2022 Invited Speaker
- 12. "Apa yang ada dalam fizik teori?", Siri 8 Kuliah Falsafah & Sains Teori, 19th March 2022. Anjuran Perbadanan Perpustakaan Awam Selangor, PPAS melalui aplikasi Zoom *Invited Speaker*
- 13. "Understanding Research in Theoretical Physics", Research Environment Among Department (READ) Talk, UPNM 26th Nov 2021 Invited Speaker
- 14. M. Rusli M.N. Nazmi, **Nurisya Mohd Shah**, Hishamuddin Zainuddin, Kar Tim Chan, *Isomorphism of Analytical Spectrum between Noncommutative Harmonic Oscillator and Landau Levels* Persidangan Fizik Kebangsaan (PERFIK 2021), 29-30th June 2021 - *Invited Speaker*
- 15. FYP Seminar, "How to write a good dissertation", Semester 2 2020/2021 (FYP A) 2nd June 2021 Invited Speaker
- 16. KURSUS PENGENALAN HYSPLIT SEBAGAI ALAT PROJEKSI BENCANA RADIOLOGI, 3 April 2021 tajuk "Lagrangian Mechanics: Introduction and Basic Concepts" organizer WeAnsa Solution (participant KKM) - *Invited Speaker*
- 17. Online Assessment Clinic (Session 1), Center for Academic 2020 participant
- 18. FYP Seminar, "How to write a good dissertation", Semester 2 2019/2020 (FYP A) 10th June 2020 Invited Speaker
- 19. FYP Seminar, "How to write a good dissertation", Semester 2 2017/2018 (FYP A) 17th April 2019 Invited Speaker
- 20. INSPEM Weekly Seminar, 3rd August 2018, "Energy correction of the noncommutative Landau problem" (Speaker)
- 21. 4th Seminar and Workshop on Numerical Analysis (SAWONA 2018), INSPEM. (Chair Session)
- 22. FYP Seminar, "How to write a good dissertation", Semester 2 2017/2018 (FYP A) 28th February 2018 Invited Speaker
- 23. Fundamental Science Congress 2017 (FSC2017), UPM, 11-12 November, 2017 (Poster presenter)
- 24. FYP Seminar, "How to write a good dissertation", Semester 1 2017/2018 (FYP A & B) 2nd November 2017 Invited speaker
- 25. National Islamic Science Seminar: Seminar Fizik Gunaan 2017, Universiti Sains Islam Malaysia, USIM, 30 Sept 2017, "Mathematical Physics: Why It Matters" (**Invited speaker**)

- 26. INSPEM weekly Seminar, MICEMS Seminar, Seeking standing waves for the NLS on quantum graphs Ricardo Adami, Sept 21, 2017. (Participant).
- 27. First Malaysian MyQuantum Information Era Strategic Hub Seminar 2017, Putrajaya Shangri-La, 24-25 May, 2017 (Invited Speaker)
- 3rd Malaysian Cryptology and Information Security Lecture Series 2017, INSPEM UPM, 16-17 May, 2017 (partcipant)
- 29. FYP Seminar, "How to write a good dissertation", Semester 2 2016/2017 (FYP A) 8th May 2017-Invited Speaker
- 30. Taklimat The Writing Cell Project, RMC UPM, 4th November 2016.(Participant)
- 31. 4th National Nobelist Mindset Workshop Program, PERMATAPintar UKM, 19-23 September, 2016. representing young scientist UPM (Physics) (Participant)
- 32. Half Day Seminar in Mathematical Physics 2016, UPM,29th August, 2016 (Chairsession, Chairman)
- 33. Fundamental Science Congress 2016 (FSC2016), UPM, 9-10 August, 2016 (Invited Speaker, Committee Member)
- 34. INSPEM's Weekly Seminar "Some families of Hermite Polynomials Arise in Physics" (29<sup>th</sup> April, 2016) (**Invited speaker**)
- 35. Program QS Ranking with PROF. DR. KEVIN J. DOWNING, 1 APRIL 2016, UPM (participant)
- 36. FYP Seminar invited talk "How to write a good dissertation" (28<sup>th</sup> March, 2016)- (speaker)
- 37. EQuaLS 8, 11-22 Jan 2016 (Chairsession, Committee)
- 38. Fundamental Science Congress 2015 (FSC2015), UPM, 11-12 November, 2015 "Some families of complex Hermite polynomials arise in NCQM model in two dimensions". (oral presenter, Chairperson Parallel Session, Examiner)
- 39. Pedagogy Seminar, "A route to non-commutative quantum mechanics: Representation of non-commutative phase space", May 5th, 2014 (oral presenter)
- 40. Research Seminar, "Some biorthogonal families of polynomials arising in non-commutative quantum mechanics", May 6th, 2014 (oral presenter)
- 41. Seminar Physique Mathematique "A note of some associated algebra of bilinear generators arise in NCQM model", May 30th, 2012 (oral presenter)
- 42. Colloque des sciences Mathematique du Québec, Summer 2010, "Group representation of Stockwell transform" (oral presenter)
- 43. Colloque des sciences Mathematique du Québec, Summer 2009 (participant)
- 44. Departmental Series Seminar, Department of Physics, Department of Mathematics and Statistics 2009-2012, Concordia University (**participant**)
- 45. Seminar Sains 2007, "Maass cusp forms for singly punctured two-torus and triply punctured two-sphere" (oral presenter)
- 46. National Physics Conference, PERFIK 2006 "Tessellation structure of singly punctured two-torus and triply punctured two-sphere" (**oral presenter**)
- 47. Conference of Advances and Theoretical Sciences 2003 (CATS2003) in Advance Technology Congress (ATC2003), "Commutator relations of local operators using embedded coordinates of  $S^2$  and  $H^{2"}$  (poster presenter)

# CONFERENCE/SEMINAR/TALK/WORKSHOP- AS CO-AUTHOR

- 1. Selvam M.T., Nurisya M.S. & Said Husain S.K., (2022). The Derivation of Parameters Preceding Schmidt Mode for Quantum Entanglement Found in Research Papers, 4th International Symposium on Multidisciplinary Science 2022.
- 2. M.A.A. Ahmed, H. Zainuddin & N.M. Shah, (2021). Thermal propagator of the Bosons and Fermions fields, Persidangan Fizik Kebangsaan, PERFIK 2021 29-30 June 2021.
- Ahmad Hazazi, Hishamuddin Zainuddin & Nurisya Mohd Shah, (2021). Canonical group quantisation of two-level classical systems on Riemann sphere, Persidangan Fizik Kebangsaan, PERFIK 2021 29-30 June 2021.
- 4. Mohd Faudzi Umar, Nurisya Mohd Shah & Hishamuddin Zainuddin, (2021). Two-parameter quantum groups for Heisenberg and extended Heisenberg group, Persidangan Fizik Kebangsaan, PERFIK 2021 29-30 June 2021.
- 5. Shelawati T, Nurisya M.S., v-Materials Technology Challenge (v-MTC 4.0 2020), 2nd Sept 2020 (Poster presenter corresponding author)
- Shelawati T, Nurisya M.S. & Mazliana Ahmad Kamaruddin, 14th Asia-Pacific Physics Conference (APPC14), 17-22nd Nov 2019, Borneo Convention Centre, Kuching, Sarawak (Oral presenter corresponding author)
- Nadhira Abd Haris, Nurisya M. Shah, Chan Kar Tim, 14th Asia-Pacific Physics Conference (APPC14), 17-22nd Nov 2019, Borneo Convention Centre, Kuching, Sarawak (Oral presenter corresponding author)
- Shelawati T, Nurisya M. Shah, Chan Kar Tim & Mazliana Ahmad Kamaruddin., International Fundamental Science Congress 2018 (iFSC2018), UPM, 23-24th October, 2018, Selangor (oral presenter - corresponding author)
- Nadhira Abd Haris, Nurisya M. Shah, Chan Kar Tim, International Fundamental Science Congress 2018 (iFSC2018), UPM, 23-24th October, 2018, Selangor (Poster presenter - corresponding author)
- 10. Ganesh Subramaniam, Hishamuddin Zainuddin & Nurisya Mohd Shah. "Killing Tensor of Five Dimensional Melvin's Spacetime" IMFP conference 3-7 Dec 2017, KL. *Book of Abstract*
- 11. M.A.A. Ahmed, S.Cherif, M. Ladreme, H. Zainuddin & Nurisya M. Shah. "Effect of colour singlet on phase transition from Hadronic gas to Partonic plasma", IMFP conference 3-7 Dec 2017. Book of Abstract
- 12. Mohd Faudzi Umar, **Nurisya Mohd Shah** & Hishamuddin Zainuddin. "Two-dimensional plane, modified symplectic structure and quantization", Int. Malaysia Frontier of Physics conference 3-7 Dec 2017. *Book of Abstract*
- 13. Siti Aqilah Muhamad Rasat, Hishamuddin Zainuddin and Nurisya M. Shah. International Conference on Research and Educational Mathematics 2017 (ICREM8), Bandung Institute of Technology (ITB), "Measurement Algebra of Complementary Observables for Dimensions Two to Five", 11-13th August 2017.

# CURRENT ONGOING ACTIVITIES

- 1. Topical group meeting (Tuesday, 12.30p.m.) on "Non-commutative Geometry" Nov, 2016 attend
- 2. Weekly Theoretical Physics Group Discussion (every Thursday, 12.00 pm). Members taking turns to freely discuss or update his/her related research interest. (*ongoing*) as a **Presenter**:
  - Feb 2023 (QuEST Group Meet Feb 2023) "On the Lax representation"
  - Sept 2022 (QuEST Group Meet August 2022) "On the Haar Measure"
  - Nov 2021 (QuEST Group Meet /2021) "On the Klein-Gordon equation with the Kratzer potential in the NC space"
  - Jan 2021 (QuEST Group Meet /2021) "Time-dependent Hamiltonian and theory of invariants"
  - Sept 10, 2020 (QuEST Group Meet /2020) "The factorization of Morse potential"
  - Dec 6th, 2018 (QuEST Group Meet /2018) "On the Schwinger representation"
  - March 29th, 2018 (QuEST Group Meet /2018) "On Mathematical features of quantum dot in spin-orbit interaction on noncommutative phase space"
  - Nov 9th, 2017 (QuEST Group Meet /2017) "On Many "Faces" of Lie Algebra"
  - Oct 20th, 2016 (QuEST Group Meet 28/2016) "A review on Ladder Operator for Morse Oscillator"
  - Mac 24rd, 2016 (QuEST Group Meet 09/2016) "A reading on unified approach for exactly solvable potentials in quantum mechanics using shift operator"
  - Nov 19th, 2015(TCPG Meet 26/2015) "A reading on factorization methods in quantum mechanics"
  - May 7th, 2015(TCPG Meet 12/2015) "A reading on the quantum mechanics on the noncommutative plane and sphere"
  - Jan 8th, 2015 (TCPG Meet 1/2015) "A reading on the two dimensional harmonic oscillator on a noncommutative space with minimal uncertainties"
  - April 24th, 2014 (TCPG Meet 12/2014) "Some complex biorthogonal polynomials in non-commutative quantum mechanics model (NCQM)"
  - Biweekly Topical group meeting (every Tuesday, 12.30 pm). Consists of two main topics i.e. Quantum Information and Complex systems which is alternate. Each member taking turns discussing particular section for selected topics. (2013 until June 2014)
- 3. New Topical group biweekly meeting (Tuesday, 12.30p.m.) alternately between "Lecture on Differential Geometry" March-April 2015 and "Mathematica", March May 2015.
- 4. Biweekly meeting (Tuesday, 12.30p.m.)on Michel Planat's journals, May July 2015.

# **RESEARCH AFFILIATES**

- Research Associates of Laboratory of Computational Sciences and Mathematical Physics, Institute for Mathematical Research, (INSPEM) UPM, Jan 2022 Feb 2024.
- Research Associates of Laboratory of Computational Sciences and Mathematical Physics, Institute for Mathematical Research, (INSPEM) UPM, Feb 2015 - Feb 2019.
- Member of Institut Fizik Malaysia since May, 2017. (MIMP 1397)
- Member of American Physical Society (APS) ID# 61197302 since May, 2015.
- Member of The Malaysian Solid State Science & Technology Society, since October 2015- MASS 459.
- Member of Persatuan Pegawai Akademik UPM PPAUPM-FS-A04402

# REFERENCES

- 1. Assoc. Professor Dr. Mohd Mustafa Awang Kechik, Head of Department of Physics, Faculty of Science, Universiti Putra Malaysia (UPM), Malaysia (Aug 2023 present)
- 2. Assoc. Professor Dr. Nor Azwady Abd Aziz, Dean of Faculty of Science, Universiti Putra Malaysia (UPM), Malaysia. (2022 present)

# OTHER ACTIVITIES

- 1. Alumni of Sekolah Menengah Sains Tuanku Jaafar, Kuala Pilah, Negeri Sembilan (1997).
- 2. Alumni of Lindau Group Meeting/Member of Lindau Group, Academy of Science Malaysia. (participating in 2004 meeting)
- 3. Member of Kelab Warga Fizik (KWF), Department of Physics, UPM (2005 present).
- 4. Treasurer of Kelab Warga Fizik, KWF (2014-present)
- 5. Alumni of Universiti Putra Malaysia, UPM, undergraduates (2002), Master Degree (2008).
- 6. Alumni of Concordia University (2014).

#### PROFESSIONAL INVOLVEMENT\*SOME FALLS UNDER AKTIVITI JARINGAN INDUSTRI & MASYARAKAT

{Name of Event}{Position}

- 1. Part of the Malaysian Quantum Initiative, MyQI Coordinator for quantum theory group (2022 present), https://www.myqi.my/
- 2. Intitute Fizik Malaysia (IFM) Council Member (Theoretical Physics), Term 2023-2025
- 3. Expository Lecture Series (EQuaLS2 2022) Chairman, chair session
- 4. Kem Gerak Ilmu 2022, Deputy Chair
- 5. Expository Lecture Series (EQuaLS2 2020) Co-Chairman, chair session
- 6. Program Nobel Laureate's Outreach CAMP (NLOC) 2022 Scientist of Tomorrow. (JK Pendaftaran & Sijil)(\*)
- 7. Program Nobel Laureate's Outreach CAMP (NLOC) 2021 Scientist of Tomorrow. (JK Teknikal)(\*)
- 8. iFSC 2021 (Ketua JK Sijil dan Pendaftaran)(\*)
- 9. Program Nobel Laureate's Outreach CAMP (NLOC) 2018 Scientist of Tomorrow. (Ketua JK Makanan & Kudapan)(\*)
- 10. Outreach Physics Program, SK Sungai Melut, Sepang, 15th August 2018. (Ketua Aktiviti Matematik)
- 11. Kem Matematik SERATAS 2018. (Module coordinator/Instructor) (\*)
- 12. Program Mentor Mentee SMK Lembah Klang. 24 April 2018. (Model coordinator/Instructor) (\*)
- 13. 4th Seminar and Workshop on Numerical Analysis (SAWONA 2018), INSPEM. (Programme Book and Publishing) (\*)
- 14. Majlis Kecemerlangan Fizik, MaKeF 2017, AJK
- 15. Workshop on Controlling Dynamics in Mathematical Models of Real Neurons 2017. (Co-Chairman)
- 16. Young Scientist Challenge 2016, ASM. (Module Coordinator) (\*)
- 17. AJK Modul Fizik Bermatematik bagi Program Kem Matematik bersama Sekolah Menengah Sains Tun Azlan Shah (SERATAS), 2016. (Fasilitator) (\*)
- 18. JTK Pengurusan Sesi Selari/Plenari/Pendaftaran, Fundamental Science Congress (FSC2016) (Ketua)
- 19. Karnival Jom Sains, STEM (11-12 March 2016) Exhibition representing QuEST in Maths (Moderator)
- 20. Expository Quantum Lecture Series 8: Quantization, Noncommutative and Nonlinearity (18-22 Jan 2016). (Secretariat Sponsorship, Chairman session)
- 21. Hari Penerangan Jabatan Fizik September 2015, (AJK Multimedia)
- 22. AJK Modul Fizik Bermatematik bagi Program Kem Matematik bersama Sekolah Menengah Sains Tun Azlan Shah (SERATAS), 2015. (Fasilitator)
- 23. Ketua Program Pertandingan Video Berasaskan Sains Matematik, peringkat institut, INSPEM UPM 2015.
- 24. AJKK Modul Sumber Pembelajaran Sains Matematik, UPM 2015.

- 25. Secretariat International Conference in Solid State Science & Technology (ICSSST 2015) Book Programme.
- 26. AJK Modul Fizik Bermatematik bagi Program Kem Matematik bersama Sekolah Menengah Sains Tun Azlan Shah (SERATAS), 2014.
- 27. Expository Quantum Lecture Series 2013: Complex Systems (EQuaLS 2013), 22-24 Nov 2013. (Secretariat)
- 28. Mathematical Methods in Brain Dynamics 2013 & Control Algorithms in Quantum Models 2013 (Chairman session)