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## EDUCATION AND ACADEMIC QUALIFICATION

<i>University</i>	<i>Year</i>	<i>Qualification</i>
Universiti Putra Malaysia, Malaysia	2021	Doctor of Philosophy ( <i>Quantum Physics</i> )
Universiti Putra Malaysia, Malaysia	2015	Master of Science ( <i>Quantum Physics</i> )
Universiti Kebangsaan Malaysia, Malaysia	2009	B. Sc. (Honours) ( <i>Major Physics</i> )

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## TEACHING EXPERIENCE

Physics 1 (General Physics, Mechanics, Wave and Vibration, Optics)

Physics 2 (Thermal Physics, Electricity and Magnetism, Modern Physics, Nuclear Physics)

## FIELD OF SPECIALIZATION

Theoretical Physics, Quantum Foundation, Geometric Quantum Mechanics

## CURRENT RESEARCH INTEREST

### *Theoretical Physics*

In my Ph.D research, I studied on the properties of spin  $1/2$ , spin 1 and spin  $3/2$  particles in geometric quantum mechanics framework. Generally the Robertson-Schrödinger uncertainty principle for these systems has been demonstrated varies along any Hamiltonian flows. This work was done by calculating the evolution of symplectic area and component of Riemannian metric under the flows. Besides, the correspondence between Poisson bracket and commutator for these systems was showed by explicitly computed the value of commutator of spin operators and compared it with the Poisson bracket of the corresponding classical observables. This study was extended by comparing the Casimir operator and its classical counterpart. The results showed that there exist correspondence between classical and quantum Casimir operator at least for the case of spin  $1/2$ . This research might be a good step toward inserting the aspect of symplectic topology such as non-squeezing theorem and clearly showed the limit of classical notion to describe the purely quantum concept.

## PUBLICATION

**H. Umair** and Z. Hishamuddin, (2014). Chaos in bohmian mechanics of commensurate harmonic oscillators. *J. Phys.: Conf. Ser.* 553 012007.

**H. Umair**, H. Zainuddin, K.T. Chan, and Sh.K. Said Husain. (in press). The generalized geometric uncertainty principle for spin  $\frac{1}{2}$  system. *Advances in Mathematics: Scientific Journal*.

**H. Umair**, H. Zainuddin, K.T. Chan, and Sh.K. Said Husain. (in press). The dynamical evolution of geometric uncertainty principle for spin  $\frac{1}{2}$  system. *Advances in Mathematics: Scientific Journal*.