

Philip Caesar M. Flores

PHD CANDIDATE · PHYSICIST · RESEARCHER

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"Study hard what interests you the most in the most undisciplined, irreverent and original manner possible." - Richard Feynmann

Education

University of the Philippines Diliman

Quezon City

PH.D. IN PHYSICS - ADVISER: ERIC A. GALAPON, PH.D.

Aug. 2019 - present

- Approved Thesis Proposal Title: Relativistic time of arrival operators
- Candidacy Exam Title: Problem of time - from standard quantum mechanics to quantum gravity
- Scholarship: Department of Science and Technology-Accelerated Science and Technology Human Resource Development Program (DOST-ASTHRDP)

University of the Philippines Diliman

Quezon City

M.S. IN PHYSICS - ADVISER: ERIC A. GALAPON, PH.D.

Aug. 2017 - Jun. 2019

- Thesis title: Weak equivalence principle in the quantum regime: Compatibility with quantum mechanics, and tunneling effects via the different quantizations of the time of arrival operator
- Studied the quantum violation of the weak equivalence principle for a structureless particle fired upward. This was done by quantizing the classical expression of the classical time of arrival using various quantization schemes, as well as supraquantization, to construct a time of arrival operator. The violation of the weak equivalence principle was demonstrated by showing mass-dependent quantum correction terms to the classical time of arrival as well as mass dependence on the time of arrival distribution.

University of the Philippines Diliman

Quezon City

B.S. IN PHYSICS - ADVISER: ERIC A. GALAPON, PH.D.

Jun. 2012 - Jun. 2017

- Thesis title: Synchronization of quantum and classical clocks, and energy translation using resolvent functional calculus for the confined time of arrival operators
- The thesis aimed to study some physical and mathematical aspects of the time of arrival operator. The first half deals with eliminating the effects of quantum correction terms up to an arbitrary order for the classical time of arrival of a free particle. By doing so, we are able to synchronize a classical and quantum clock that uses the time of arrival of the free particle as time interval markers. The second half deals with the energy translation properties of the confined time of arrival operators.

Philippine Science High School - Western Visayas Campus

Iloilo City

HIGH SCHOOL DIPLOMA

Jun. 2008 - Mar. 2012

- Graduated with High Honours
- Participated in competitions to represent the school

Experience

National Institute of Physics, University of the Philippines Diliman

Quezon City

SCIENCE RESEARCH SPECIALIST

Aug. 2019 - Dec. 2019

- Project: Standards and Testing Automated Modular Platform (Stamp)
- Principal Investigator: Giovanni Tapang, Ph.D.
- Develop a cheap alternative for existing ISO methodologies implemented in Regional Standards and Testing Laboratories (RSTLs).

National Institute of Physics, University of the Philippines Diliman

Quezon City

INSTRUCTOR

Aug. 2017 - Jul. 2019

- Taught recitation classes on Classical Mechanics (Physics 71), Optics and Electricity and Magnetism (Physics 72), Thermodynamics, Special Relativity, and Quantum Mechanics (Physics 73), and Modern Physics (Physics 104).
- Taught laboratory classes on Classical Mechanics (Physics 71.1), Optics Electricity and Magnetism (Physics 72.1), and Thermodynamics, Special Relativity, and Quantum Mechanics (Physics 73.1).
- Checked problem sets for Mathematical Physics (Physics 112), Statistical Physics (Physics 151 and 152), and Quantum Mechanics (Physics 241 and 242).

Research

PREPRINT

2022 **Instantaneous tunneling of relativistic massive spin-0 particles**, PCM Flores, and EA Galapon,
arXiv:2207.09040

NIP, UPD

PUBLICATIONS

- 2022 **Relativistic free-motion time-of-arrival operator for massive spin-0 particles with positive energy**, PCM Flores and EA Galapon, Physical Review A 99, 042113 (2022). *NIP, UPD*
- 2019 **Quantum free-fall motion and quantum violation of the weak equivalence principle**, PCM Flores and EA Galapon, Physical Review A 99, 042113 (2019). *NIP, UPD*
- 2016 **Synchronizing quantum and classical clocks made of quantum particles**, PCM Flores, RCF Caballar, and EA Galapon, Physical Review A 94, 032123 (2016). *NIP, UPD*

PROCEEDINGS

- 2019 **Violation of the weak equivalence principle via the Born-Jordan quantized TOA operator**, PCM Flores and EA Galapon, Proceedings of the Samahang Pisika ng Pilipinas *Tagbilaran City*
- 2018 **Violation of the weak equivalence principle via the time of arrival operator**, PCM Flores and EA Galapon, Proceedings of the Samahang Pisika ng Pilipinas *Puerto Prinsesa City*
- 2017 **Covariance property of the confined time of arrival operators**, PCM Flores and EA Galapon, Proceedings of the Samahang Pisika ng Pilipinas *Cebu City*
- 2016 **Synchronizing quantum and classical clocks made of quantum particles up to \hbar^2** , PCM Flores, RCF Caballar, and EA Galapon, Proceedings of the Samahang Pisika ng Pilipinas *Iloilo City*
- 2015 **The resolvent operators of the confined time of arrival operators**, PCM Flores, RCF Caballar, and EA Galapon, Proceedings of the Samahang Pisika ng Pilipinas *Vigan City*

REFEREE REQUESTS

The European Physical Journal Plus D,
Proceedings of the Samahang Pisika ng Pilipinas (Physics Society of the Philippines),

Conferences & Workshops

- 2022 **Contributing speaker**, 15th Asia Pacific Physics Conference (Virtual meeting - Aug 21-26) *South Korea*
- 2021 **Poster presentation**, Time in Quantum Theory: from mathematical foundations to operational characterization (Aug 30 - Sept 3) *Switzerland*
- 2021 **Participant**, Quantizing Time, Perimeter Institute (Virtual Meeting) *Canada*
- 2021 **Participant**, 7th Les Houches School in Computational Physics: Dynamics of Complex Quantum Systems, from Theory to Computation (Virtual meeting) *France*
- 2021 **Participant**, Conference on Time Crystals (An ICTP virtual meeting) *Italy*
- 2019 **Poster presentation**, ICTP Asian Network School and Workshop on Complex Condensed Matter Systems, National Institute of Physics, UP Diliman *Philippines*
- 2019 **Poster presentation**, 2nd Annual Graduate Students Research Conference, College of Science Administration Building Auditorium, UP Diliman *Philippines*
- 2019 **Oral presentation**, 37th Samahang Pisika ng Pilipinas International Physics Conference and Annual Meeting, Tagbilaran, Bohol *Philippines*
- 2019 **Poster presentation**, Time and fundamentals of quantum mechanics, The David Lopatie Conference Centre, Weizmann Institute of Science *Israel*
- 2018 **Oral presentation**, 36th Samahang Pisika ng Pilipinas International Physics Conference and Annual Meeting, Puerto Prinsesa, Palawan *Philippines*
- 2017 **Oral presentation**, 35th Samahang Pisika ng Pilipinas International Physics Conference and Annual Meeting, Cebu City, Cebu *Philippines*
- 2017 **Oral presentation**, 8th Jagna International Workshop: Structure, Functions and Dynamics from nm to Gm , Jagna, Bohol *Philippines*
- 2016 **Oral presentation**, 34th Samahang Pisika ng Pilipinas International Physics Conference and Annual Meeting, Iloilo City, Iloilo *Philippines*
- 2015 **Oral presentation**, 33rd Samahang Pisika ng Pilipinas International Physics Conference and Annual Meeting, Vigan, Ilocos Sur *Philippines*
- 2014 **Participant**, CERN School Philippines, National Institute of Physics, UP Diliman *Philippines*

Awards and Grants

GRANTS

2022	Student Research Support Fund (SRSF) - Research Dissemination Grant , Support for DOST scholars accepted for oral/poster presentation in a local or international conference	South Korea
2019	Office of International Linkages (OIL) Travel Grant , Support for researchers and graduate students for paper presentation at international conferences	Israel
2019, 2018	Office of the Vice President for Academic Affairs (OVPA) Research Dissemination Grant , Awarded to outstanding faculty and REPS researchers who receive invitations or gain acceptance to present their research papers in prestigious international conferences.	Philippines

AWARDS

2019	International Publication Award , Awarded by the University of the Philippines to faculty and students who were able to publish papers in ISI journals	UP Diliman
2017	Leticia Shahani Award for Best Undergraduate Thesis in Physics , College of Science Graduation	UP Diliman
2016	Diliman BPI-DOST Science Award , Awardees are selected on the basis of their academic and research performance and nomination from the school	UP Diliman
2016	International Publication Award , Awarded by the University of the Philippines to faculty and students who were able to publish papers in ISI journals	UP Diliman
2012-2016	University Scholar , Awarded by the University of the Philippines to students who were able to garner a GWA higher than 1.25 for the semester, 1st Sem A.Y. 15-16, 1st Sem A.Y. 12-13	UP Diliman
	College Scholar , Awarded by the University of the Philippines to students who were able to garner a GWA higher than 1.75 but lower than 1.25 for the semester, 2nd Sem A.Y. 14-15, 2nd Sem A.Y. 12-13	UP Diliman

Affiliations

2018-present	Samahang Pisika ng Pilipinas , Professional organization of physicists and physics educators in the Philippines.	UP Diliman
2015-present	UP Alpha Sigma Fraternity , The UP Alpha Sigma Fraternity is the first Philippine progressive fraternity that was established to form a unique vision that aimed at principled brotherhood, fused with the scholarly pursuit of truth-reason-justice.	UP Diliman
2014-present	Theoretical Physics Group , Members of the group perform research in mathematical physics, computational physics, statistical mechanics, quantum mechanics, nonlinear problems, gravitational physics, and relativistic astrophysics.	UP Diliman

References

Eric A. Galapon, PhD

PROFESSOR

- Thesis Adviser, Theoretical Physics Group, National Institute of Physics, University of the Philippines Diliman
- eric.galapon@up.edu.ph

Michael Francis Ian Vega II, PhD

PROFESSOR

- Program Coordinator, Theoretical Physics Group, National Institute of Physics, University of the Philippines Diliman
- ivega@nip.upd.edu.ph

Giovanni A. Tapang, PhD

PROFESSOR

- Dean, College of Science, University of the Philippines Diliman
- gtapang@nip.upd.edu.ph