

# Philip Caesar Flores, PhD

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## Experience

### Postdoctoral Researcher

MAX BORN INSTITUTE FOR NONLINEAR OPTICS AND SHORT PULSE SPECTROSCOPY

- Supervisor: Prof. Dr. Olga Smirnova
- Develop geometric concepts in the photoionization of chiral molecules

Berlin

Mar. 2023 - present

### Teaching Fellow

NATIONAL INSTITUTE OF PHYSICS, UNIVERSITY OF THE PHILIPPINES DILIMAN

- Scholarship offered by UP to PhD students in order to reduce the teaching load of the faculty members
- Responsibilities include assisting faculty members in teaching classes

Quezon City

Sept. 2022 - Jan. 2023

### Science Research Specialist

NATIONAL INSTITUTE OF PHYSICS, UNIVERSITY OF THE PHILIPPINES DILIMAN

- 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).

Quezon City

Aug. 2019 - Dec. 2019

### Instructor

NATIONAL INSTITUTE OF PHYSICS, UNIVERSITY OF THE PHILIPPINES DILIMAN

- Taught classes on Classical Mechanics, Optics and Electricity and Magnetism, Thermodynamics, Special Relativity, and Quantum Mechanics, and Modern Physics.
- Taught laboratory classes on Classical Mechanics, Optics Electricity and Magnetism, and Thermodynamics, Special Relativity, and Quantum Mechanics.

Quezon City

Aug. 2017 - Jul. 2019

## Education

### Ph.D. in Physics - Supervisor: Eric A. Galapon, Ph.D.

UNIVERSITY OF THE PHILIPPINES DILIMAN

- Dissertation title: Theory of quantized relativistic time-of-arrival operators for spin-0 particles and its application in the quantum tunneling time problem

Quezon City

Aug. 2019 - Jan. 2023

### M.Sc. in Physics - Supervisor: Eric A. Galapon, Ph.D.

UNIVERSITY OF THE PHILIPPINES DILIMAN

- 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

Quezon City

Aug. 2017 - Jun. 2019

### B.S. in Physics - Supervisor: Eric A. Galapon, Ph.D.

UNIVERSITY OF THE PHILIPPINES DILIMAN

- Thesis title: Synchronization of quantum and classical clocks, and energy translation using resolvent functional calculus for the confined time of arrival operators

Quezon City

Jun. 2012 - Jun. 2017

## Awards and Grants

2023	<b>Most Outstanding PhD in Physics Graduate</b> , Awarded by the National Institute of Physics, UP Diliman during the Recognition Rites for Class 2023	UP Diliman
2022, 2019, 2018	<b>Office of the Vice President for Academic Affairs (OVPA) Research Dissemination Grant</b> , Awarded to outstanding faculty and REPS researchers who receive invitations or gain acceptance to present their research papers in prestigious international conferences.	Philippines
2022	<b>Student Research Support Fund (SRSF) - Research Dissemination Grant</b> , Support for DOST scholars accepted for oral/poster presentation in a local or international conference	South Korea & Austria
2019	<b>Office of International Linkages (OIL) Travel Grant</b> , Support for researchers and graduate students for paper presentation at international conferences	Israel
2017	<b>Leticia Shahani Award for Best Undergraduate Thesis in Physics</b> , College of Science Graduation	UP Diliman
2016	<b>Diliman BPI-DOST Science Award</b> , Awardees are selected on the basis of their academic and research performance and nomination from the school	UP Diliman

## Research

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### PUBLICATIONS

- 2024 **Partial and full tunneling processes across potential barriers**, PCM Flores, DAL Pablico, and EA Galapon, Europhysics Letters, *accepted manuscript* [EPL](#)
- 2023 **Quantized relativistic time-of-arrival operators for spin-0 particles and the quantum tunneling time problem**, PCM Flores, and EA Galapon, The European Physical Journal Plus, 138, 375 [EPJP](#)
- 2023 **Instantaneous tunneling of relativistic massive spin-0 particles**, PCM Flores, and EA Galapon, Europhysics Letters, 141(1), 10001 [EPL](#)
- 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). [PRA](#)
- 2019 **Quantum free-fall motion and quantum violation of the weak equivalence principle**, PCM Flores and EA Galapon, Physical Review A 99, 042113 (2019). [PRA](#)
- 2016 **Synchronizing quantum and classical clocks made of quantum particles**, PCM Flores, RCF Caballar, and EA Galapon, Physical Review A 94, 032123 (2016). [PRA](#)

### CONFERENCE 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 Princesa 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](#)

## Conferences & Workshops

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- 2022 **Poster Presentation**, 10th ASTHRDP Graduate Scholars' Conference (Sept 22 - 23) [Philippines](#)
- 2022 **Participant**, Time in Quantum Theory (Sept 19 - 23) [Austria](#)
- 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 Princesa, 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](#)

## Affiliations

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2023-present	<b>Strong-Field Theory Group</b> , Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy	<i>Berlin, Germany</i>
2018-present	<b>Samahang Pisika ng Pilipinas</b> , Professional organization of physicists and physics educators in the Philippines.	<i>UP Diliman</i>
2015-present	<b>UP Alpha Sigma Fraternity</b> , 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.	<i>UP Diliman</i>
2014-2023	<b>Theoretical Physics Group</b> , Members of the group perform research in mathematical physics, computational physics, statistical mechanics, quantum mechanics, nonlinear problems, gravitational physics, and relativistic astrophysics.	<i>UP Diliman</i>

## References

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### 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