

MARK IVAN UGALINO

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EDUCATION

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| University of the Philippines, Diliman Doctor of Philosophy in Physics National Institute of Physics | 2020 (<i>ongoing</i>) |
| University of the Philippines, Diliman Master of Science in Physics National Institute of Physics | 2018 – 2020 GWA:1.6786/1.0000 (GPA: 3.37/4.00) |
| University of the Philippines, Diliman Bachelor of Science in Physics, <i>Nominated for the Best BS Physics thesis award</i> National Institute of Physics | 2013 – 2018 GWA: 1.7895/1.0000 (GPA: 3.26/4.00) |
| Quezon City Science High School High school diploma | 2009 – 2013 |

SKILLS

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|--------------------------------|---|
| Research specialization | Theoretical astrophysics |
| Computer Languages | Python, <i>knowledgeable</i> in C, Julia and R |
| Software & Tools | L ^A T _E X, Excel, Mathematica, MATLAB, Scilab |
| Languages | English, Filipino, <i>knowledgeable</i> in Spanish |
| Other skills | Astronomy education and outreach |

RESEARCH EXPERIENCE AND PUBLICATIONS

Masteral thesis: *Dynamical friction effects on circular orbits immersed in a finite gaseous background* (Adviser: Ian Vega, Ph.D.)

- Proposed a solution to the dynamical friction problem in a finite cylindrical domain as an extension to the straight-line formulation of Vicente et al in slab geometries (2019), the motivation of which is the formation and evolution of giant planets

Steady-state density perturbations induced by a point mass in a finite cylinder (Co-author: Ian Vega, Ph.D.)

Submitted to: *Proceedings of the 38th Samahang Pisika ng Pilipinas Physics Congress*

- Publication in an international conference emanating from my masteral thesis.

Undergraduate thesis: *Density perturbation induced by relativistic bodies in slightly-eccentric orbits* (Adviser: Ian Vega, Ph.D.)

**Nominated for outstanding BS Physics undergraduate thesis*

- Used a linear perturbation analysis to extend the relativistic formulation of dynamical friction to the slightly eccentric orbit case, that is motivated by the increasing interest on extreme-mass-ratio inspirals as gravitational wave sources.
- Developed a purely analytic approach from a previous self-force calculation by Diaz-Rivera et al (2004) to reproduce a result previously obtained through a semi-analytic Newtonian analysis by Kim & Kim (2007).

Density perturbations in a collisional fluid induced by a particle on a slightly-eccentric orbit (Co-author: Ian Vega, Ph.D.)

Submitted to: *Proceedings of the 36th Samahang Pisika ng Pilipinas Physics Congress*

- Publication in an international conference emanating from my undergraduate thesis.

GRANTS

UP Diliman OVCRD Thesis and Dissertation Grant

Jan. 2020-August 2020

- A grant amounting to Php 30,000.00 (~ 600 USD) was awarded as research support for student faculty and staff.

PROFESSIONAL AFFILIATIONS

Samahang Pisika ng Pilipinas

Associate Member

Oct. 2020-present

AWARDS AND RECOGNITIONS

Gawad Direktor para sa Natatanging Bagong Guro

Dec. 7, 2018

National Institute of Physics, UP Diliman

- The award was given in recognition of the exemplary performance of a newly hired junior faculty of the institute.

Gawad Direktor para sa Natatanging Discussion Teacher

Dec. 7, 2018

National Institute of Physics, UP Diliman

- This award is given in recognition of the exemplary performance of a junior faculty member as a discussion teacher for lecture classes offered by the institute.

SCHOOLS AND CONFERENCES

Deciphering Dark Matter: From Galaxies to the Universe

September 14–25, 2020

Institut Teknologi Bandung, Bandung, West Java, Indonesia

- Link: <https://www.as.itb.ac.id/ssgc2020/>

Philippine Meteorological Society Annual Convention

July 20–23, 2020

Zoom Teleconference

ICTP Asian Network School and Workshop on Complex Condensed Matter Systems

November 4–8, 2019

National Institute of Physics, University of the Philippines Diliman, Philippines

- Link: <https://spp-online.org/activities/ictp-asian-network-2019/>

UP SITF C Programming Short Course

Summer 2014

University of the Philippines Diliman

- Link: <https://tinyurl.com/y2rmjm48>

5th International Research School

June 24–July 4, 2012

Zvenigorod, Moscow, Russia

- Link: <http://irschool.org/>

WORK EXPERIENCE AND EXTRA-CURRICULAR ACTIVITIES

Instructor

August 2018 – present

National Institute of Physics, UP Diliman

- Currently teaching/taught the following courses:
 - Physics 71 (*Elementary Physics I: Classical Mechanics*)
 - Physics 72 (*Elementary Physics II: Electromagnetism and Optics*)
 - Physics 72.1 (*Elementary Physics II Laboratory*)
 - Applied Physics 181 and 182 (*Physical Electronics I and II*) Laboratory
 - Physics 107.1 (*Fundamental Physics II Laboratory*)
 - Applied Physics 155 (*Computer Methods in Physics I*) Laboratory

- Handles online courses on classical mechanics, electromagnetism, and computational methods in Physics during the Academic Year 2020-2021.
- Course group leader of the elementary electromagnetism and optics (Physics 72.1) laboratory course from August 2019 to May 2020.
- Awarded as “Gawad Direktor para sa natatanging Bagong Guro” and “Gawad Direktor para sa natatanging Discussion Teacher” on December 2018 (See *Awards and Recognitions*)

Reviewer

2019 – present

Proceedings of the Samahang Pisika ng Pilipinas Physics Conference

- Reviews scientific articles submitted to the Samahang Pisika ng Pilipinas for its annual international conference on different fields of Physics, e.g. theoretical physics.

Student researcher

Aug. 2018 – present

Gravity, Group, Theoretical Physics Group, National Institute of Physics

- Worked on research that led to the publication of two (2) papers in an international conference (See *Research Experience* for details).
- Worked on research that led to an award-nominated undergraduate thesis.

University of the Philippines Astronomical Society

2015 – present

Education and Research Cluster Coordinator

Jun. – Dec. of 2017

- Gave lectures on the subject of celestial spheres to applicants as part of our semestral application process.
- Developed an astronomy learning curriculum for our applicants.
- Served as head during the 2016 installment of the Big Bang! Astronomy Quiz Show held during the 2016 National Astronomy Week
- Expanded the book and periodical collection of the organization through donation campaigns
- Engaged high school students through lectures and activities about astronomy (history, misconceptions, and basic facts)

Head Writer

2017 – 2018

Parish of the Holy Sacrifice Media Ministry

- Generated media content (*news articles, reflections*) for the Parish website, and for *Handuhay*, the official newsletter of the Parish.

PROFESSIONAL REFERENCES

Ian Vega, Ph.D.

Adviser and Professor of Physics

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National Institute of Physics, UP Diliman

Reina Reyes, Ph.D.

Associate Professor of Physics

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