MARK IVAN UGALINO

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EDUCATION

University of Massachusetts, Dartmouth 2021 (*ongoing*)
Doctor of Philosophy in Engineering and Applied Science
College of Engineering

University of the Philippines, Diliman 2020
Doctor of Philosophy in Physics
National Institute of Physics

University of the Philippines, Diliman 2018 – 2020
Master of Science in Physics GWA:1.6786/1.0000 (GPA: 3.37/4.00)
National Institute of Physics

University of the Philippines, Diliman 2013 – 2018
Bachelor of Science in Physics, GWA: 1.7895/1.0000 (GPA: 3.26/4.00)
Nominated for the Best BS Physics thesis award
National Institute of Physics

Quezon City Science High School 2009 – 2013
High school diploma

SKILLS

Research specialization	Theoretical astrophysics
Computer Languages	Python, *knowledgeable* in C, Julia and R
Software & Tools	LaTeX, Excel, Mathematica, MATLAB, Scilab
Languages	English, Filipino, *knowledgeable* 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 ($\sim$ 600 USD) was awarded as research support for student faculty and staff.

PROFESSIONAL MEMBERSHIPS

Samahang Pisika ng Pilipinas (*Physics Society of the Philippines*) Oct. 2020-*present*
Associate Member

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 ATTENDED

38$^{\text{th}}$ Samahang Pisika ng Pilipinas Physics Conference October 19–23, 2020
Zoom teleconference

· *Contributed talk*: Steady-state density perturbations induced by a point mass in a finite cylinder
· Link: `https://spp-online.org/activities/spp2020/`

Deciphering Dark Matter: From Galaxies to the Universe September 14–25, 2020
Institut Teknologi Bandung, Bandung, West Java, Indonesia (on-line)

· 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`

5$^{\text{th}}$ International Research School June 24–July 4, 2012
Zvenigorod, Moscow, Russia

· Link: `http://irschool.org/`

WORK EXPERIENCE AND EXTRA-CURRICULAR ACTIVITIES

Teaching Assistant 2021 – present
Department of Physics, UMass Dartmouth

Instructor August 2018 – December 2020
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 2015 – 2020
Gravity Group, Theoretical Physics Group, National Institute of Physics *Jan. 2017 – 2020*

· 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*

· 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
· 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 (BSc and MSc) and Professor of Physics
ivega@nip.upd.edu.ph
National Institute of Physics, UP Diliman

Robert Fisher, Ph.D.
Adviser (PhD) and Associate Professor of Physics
rfisher1@umassd.edu
Department of Physics, UMass Dartmouth

Johnrob Y. Bantang, Ph.D.
Associate Professor of Physics
jybantang@nip.upd.edu.ph
National Institute of Physics, UP Diliman

Reina Reyes, Ph.D.
Associate Professor of Physics
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