MARK IVAN UGALINO

+63 998 951 43 98 ◇ mugalino@nip.upd.edu.ph

EDUCATION

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

University of the Philippines, Diliman 2013 – 2018
Bachelor of Science in Physics, GWA: 1.7895/1.0000
Nominated for the Best BS Physics thesis award Physics and Math GWA: 1.794/1.000
National Institute of Physics

Quezon City Science High School 2009 – 2013
High school diploma

PUBLICATIONS

Steady-state density perturbations induced by a point mass in a finite cylinder (Co-author: Ian Vega, PhD)
Submitted to: *Proceedings of the 38th Samahang Pisika ng Pilipinas Physics Congress*

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

Density perturbations in a collisional fluid induced by a particle on a slightly-eccentric orbit (Co-author: Ian Vega, PhD)
Submitted to: *Proceedings of the 36th Samahang Pisika ng Pilipinas Physics Congress*

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

RESEARCH EXPERIENCE

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

- Proposed a Green's function solution to the wave equation for the density perturbations induced by circular orbits immersed in a finite cylindrical domain. This procedure was done 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
- Implemented an adaptive Monte Carlo integration strategy to solve the gravitational Poisson equation sourced by the density perturbations, for different Mach numbers and background geometries.

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

RESEARCH GRANTS AND INSTRUCTORSHIP

UP Diliman OVCRD Thesis and Dissertation Grant Jan. 2020-July 2020

· A grant amounting to Php 30,000.00 ($\sim$ 600 USD) was awarded as research support for student faculty and staff.

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*)

· 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.

SKILLS

Research specialization	Stellar and planetary astrophysics
Computer Languages	Python, *knowledgeable* in Julia and R
Software & Tools	LaTeX, Excel, Mathematica, MATLAB, Scilab
Languages	English, Filipino, *knowledgeable* in Spanish
Other skills	Astronomy education and outreach

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.

WORK EXPERIENCE AND EXTRA-CURRICULAR ACTIVITIES

Theoretical Physics Group, National Institute of Physics Aug. 2018 – present
Student researcher

· Worked on research that led to the publication of one (1) paper and submission of one (1) paper 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.

Parish of the Holy Sacrifice Media Ministry 2017 – 2018
Head Writer *2018*

· 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
ivega@nip.upd.edu.ph
National Institute of Physics, UP Diliman

Eric Galapon, Ph.D.
Professor of Physics
eagalapon@up.edu.ph
National Institute of Physics, UP Diliman

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