

Jésus Miguel Yulo Asunción

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RESEARCH INTERESTS

Modified/alternative theories of gravity, general relativity, black holes, cosmology, stellar astrophysics, nonlinear dynamical systems, chaos theory

EDUCATION

University of Nottingham, UK 2025 -
Doctor of Philosophy in Mathematics
Supervisors: Dr. Thomas Sotiriou, Dr. Laura Sberna

University of St Andrews, UK 2023 - 2024
Master of Science in Astrophysics, *with Distinction* GPA: 17.2
Supervisors: Dr. Keith Horne, Dr. Martin Dominik, Dr. Ian Bonnell

University of the Philippines Diliman, Philippines 2018 - 2022
Bachelor of Science in Physics, *Summa Cum Laude* GWA: 1.1471
Supervisor: Dr. Ian Vega

Ateneo de Manila Senior High School, Philippines 2016 - 2018
STEM Strand, *Valedictorian, First Honors, STEM Strand Award*

PUBLICATIONS AND PRE-PRINTS

1. Kusano R., Horne K., Koenig F., & **Yulo Asuncion M.** *Loading the stable photon sphere in Weyl conformal gravity metrics*, [arXiv Preprint \(2025\)](#)
2. Kusano R., **Yulo Asuncion M.**, & Horne K., *Charged black holes in Weyl conformal gravity*, [Classical and Quantum Gravity](#). in press (2025)
3. **Yulo Asuncion M.**, Horne K., Kusano R., & Dominik, M., *Structure of Kerr black hole spacetimes in Weyl conformal gravity*, [Classical and Quantum Gravity](#) 42(21) 215005 (2025)
4. **Yulo JM.** and Vega I., *Strange attractors of long-period variable stars in a one-zone model of stellar pulsation*, [Proceedings of the Samahang Pisika ng Pilipinas \(Philippine Physics Society\) 39, SPP-2021-1C-04 \(2021\)](#)

ACADEMIC RESEARCH PROJECTS

School of Mathematical Sciences, University of Nottingham

Title: Black holes beyond GR and the Standard Model 2025 -
Supervisors: Dr. Thomas Sotiriou, Dr. Laura Sberna

School of Physics and Astronomy, University of St Andrews

Title: [Structure of Kerr black hole spacetimes in Weyl conformal gravity](#) 2024
Supervisors: Dr. Keith Horne, Dr. Martin Dominik
We map the spacetime structures and extremal limits of solutions to the rotating Mannheim-Kazanas metric for varying values of the conformal gravity β, γ , and κ parameters.

Title: Accretion and the formation of high mass stars 2024
Supervisor: Dr. Ian Bonnell
 We tackle the angular momentum problem of massive star formation by developing a semi-analytic criterion for the accretion of gas and apply it to an N -body simulation of a molecular cloud core.

National Institute of Physics, University of the Philippines Diliman

Title: Dynamics and strange attractors of stellar pulsation in one-zone models of long-period variable stars 2020 - 2022
Supervisor: Dr. Ian Vega
 We discover a phase space equilibrium curve and morphological similarities between the non-adiabaticity and κ -mechanism routes to chaos in one-zone models of variable stars.

TALKS

Structure of Kerr black hole spacetimes in Weyl conformal gravity Bad Liebenzell, Germany 2024
 Contributed Talk
 ISAPP School: Neutrinos and Dark Matter

Strange attractors of long-period variable stars in a one-zone model of stellar pulsation [Link] Online 2021
 Contributed Talk
 39th Samahang Pisika ng Pilipinas (Philippine Physics Society) Conference

Intracellular biodiesel production and lipid characterization of microalgae isolated from local water environs in the Ateneo de Manila University Seoul, South Korea 2017
 Poster Presentation
 International Conference of the Korean Society for Molecular and Cellular Biology

ACADEMIC HONORS AND SCHOLARSHIPS

Distinction Degree Classification 2024
 University of St Andrews

Dean's List 2024
 University of St Andrews

Vice-Chancellor's International Scholarship (£2,000) *Declined* 2023
 Cardiff University
Declined due to pursuing MSc Astrophysics at the University of St Andrews

Science and Engineering Global Excellence Scholarship (£2,000) *Declined* 2023
 Queen Mary University of London
Declined due to pursuing MSc Astrophysics at the University of St Andrews

Summa Cum Laude 2022
 University of the Philippines Diliman

Leticia Shahani Award for Best Undergraduate Thesis in Physics (₱10,000) 2022
 College of Science, University of the Philippines Diliman

University and College Scholar 2018 - 2022
 College of Science, University of the Philippines Diliman
 (Semestral Award)

Ateneo Freshman Merit Scholarship (₱ 200,000)

Declined 2018

Ateneo de Manila University

Declined due to pursuing BS Physics at the University of the Philippines Diliman

SCHOOLS AND WORKSHOPS ATTENDED

SIGRAV International School 2025 [[Link](#)]

Salerno, Italy 2025

Italian Society for General Relativity and Gravitational Physics

XVII Black Holes Workshop [[Link](#)]

Aveiro, Portugal 2024

University of Aveiro

ISAPP School: Neutrinos and Dark Matter [[Link](#)]

Bad Liebenzell, Germany 2024

Karlsruhe Institute of Technology

12th Aegean Summer School [[Link](#)]

Sifnos, Greece 2024

National Technical University of Athens

Advanced School on Quantum Spacetime [[Link](#)]

Warsaw, Poland 2024

University of Warsaw

Star Clusters: The Gaia Revolution [[Link](#)]

Online 2021

Institute of Cosmos Sciences, University of Barcelona

2nd Gravity Group Workshop

Online 2020

[Gravity Group](#), National Insitute of Physics, University of the Philippines Diliman

EMPLOYMENT HISTORY

Digital Assets Manager, Canlubang Waterworks Corporation, Philippines

2022 - 2023

- Assisted in the web integration of this provincial utilities company.
- Executed quantitative calculations relating to water flow and distribution.

Debate Coach, Ateneo de Manila Senior High School, Philippines

2018 - 2022

Trained and mentored high school students to become champions and top speakers of dozens of international, regional, and local parliamentary debate competitions.

SKILLS

Programming Languages and Typesetting

Python, Mathematica, Fortran, L^AT_EX

Programming Packages/Libraries

numpy, matplotlib, pandas, astropy, MESA, xCoba, TikZ, etc.

Languages

English, Filipino

Miscellaneous

- Multi-awarded parliamentary debate speaker
- Operations head of numerous debate tournaments

REFERENCES

Keith Horne, Ph.D.

Emeritus Professor

School of Physics and Astronomy, University of St Andrews

kdh1@st-andrews.ac.uk

Martin Dominik, Dr. rer. nat

Reader

School of Physics and Astronomy, University of St Andrews

md35@st-andrews.ac.uk

Ian Vega, Ph.D.

Professor

National Institute of Physics, University of the Philippines Diliman

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Reinabelle Reyes, Ph.D.

Associate Professor

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Last updated 24 December 2025. Copies of dissertations and documentation available upon request.