

# Jésus Miguel Yulo Asunción

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## RESEARCH INTERESTS

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

## EDUCATION

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<b>University of Nottingham, UK</b> Doctor of Philosophy in Mathematics Supervisors: Dr. Thomas Sotiriou, Dr. Laura Sberna	2025 -
<b>University of St Andrews, UK</b> Master of Science in Astrophysics, <i>with Distinction</i> Supervisors: Dr. Keith Horne, Dr. Martin Dominik, Dr. Ian Bonnell	2023 - 2024 GPA: 17.2
<b>University of the Philippines Diliman, Philippines</b> Bachelor of Science in Physics, <i>Summa Cum Laude</i> Supervisor: Dr. Ian Vega	2018 - 2022 GWA: 1.1471
<b>Ateneo de Manila Senior High School, Philippines</b> STEM Strand, <i>Valedictorian, First Honors, STEM Strand Award</i>	2016 - 2018

## PUBLICATIONS AND PRE-PRINTS

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1. Kusano R., Horne K., Koenig F., & **Yulo Asuncion M.** *Backreactions from loading the stable photon sphere in Weyl conformal gravity*, *Classical and Quantum Gravity*. in press (2026)
2. Kusano R., **Yulo Asuncion M.**, & Horne K., *Charged black holes in Weyl conformal gravity*, *Classical and Quantum Gravity* **43**(3) 035008 (2026)
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

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### 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  $\beta, \gamma$ , and  $\kappa$  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  $\kappa$ -mechanism routes to chaos in one-zone models of variable stars.

## TALKS

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**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

39<sup>th</sup> 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

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**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

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**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

**12<sup>th</sup> 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

**2<sup>nd</sup> Gravity Group Workshop**

Online 2020

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

## EMPLOYMENT HISTORY

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**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

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**Programming Languages and Typesetting**

Python, Mathematica, Fortran, L<sup>A</sup>T<sub>E</sub>X

**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

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**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

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**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 4 February 2026. Copies of dissertations and documentation available upon request.