MARK IVAN UGALINO

www (dot) markivanugalino (dot) com ◇ ugalino (at) umd (dot) edu

EDUCATION

University of Maryland, College Park — Fall 2023 – *present*
Doctor of Philosophy in Astronomy
Department of Astronomy

University of Massachusetts, Dartmouth — 2021 – 2023
Master of Science in Physics
College of Engineering

University of the Philippines, Diliman — 2018 – 2020
Master of Science in Physics
National Institute of Physics

University of the Philippines, Diliman — 2013 – 2018
Bachelor of Science in Physics
National Institute of Physics

Quezon City Science High School — 2009 – 2013
High school diploma

SKILLS

Computer Languages	Python, Fortran, C/C++ *knowledgeable* in Julia and R
Software & Tools	ART (C, Kravstov et al), RAMSES (Fortran, Teyssier), Arepo (C, Springel), FLASH (Fortran, Fryxell et al), MESA (Fortran, Paxton et al), yt (Python, Turk et al), SuperNu (Fortran, van Rossum, Wollaeger), Torch (Fortran, Timmes)
HPC Systems	TACC Stampede2, UMassD CARNIE, UMD Zaratan

MENTORING

Nar Jasen Dela Cruz (University of the Philippines Baguio, co-adviser)

Project: *Investigating lunar formation scenarios using SPH*

Jin Young Kim (Wake Technical Community College *through* GRAD-MAP Summer Scholars 2025)

Project: *Magnetic fields in galaxies*

Prabodha Mudalige (MS Physics, UMass Dartmouth *now* PhD Physics, UT Knoxville)

Project: *Viscous evolution of astrophysical disks*

GRANTS AND RECOGNITIONS

2023 NASA FINESST Research Grant (USD 148,826.00) — *declined*
Among first 27 selected for award out of 262 submitted proposals (10.3% award rate)

Graduate Dean's Fellowship (USD 10,000.00) — Fall 2023
Department of Astronomy, University of Maryland College Park

Chancellor's Centennial Engineering Scholarship — Spring 2023
University of Massachusetts Dartmouth

Graduate Research Award — 04/27/2022
Department of Physics, University of Massachusetts Dartmouth

FIP Distinguished Student Award — 02/2022
American Physical Society

Gawad Direktor para sa Natatanging Bagong Guro 12/07/2018
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 12/07/2018
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.

PUBLICATIONS

Using ^{44}Ti Emission to Differentiate Between Thermonuclear Supernova Progenitors
D Kosakowski, MI Ugalino, R Fisher, O Graur, A Bobrick, HB Perets (2022) (*accepted to MNRAS Letters*)

Steady-state density perturbations induced by a point mass in a finite cylinder.
MI Ugalino, MFI Vega (2020) Proceedings of the 38th Samahang Pisika ng Pilipinas Physics Congress

Density perturbations in a collisional fluid induced by a particle on a slightly-eccentric orbit.
MI Ugalino, MFI Vega (2018) Proceedings of the 36th Samahang Pisika ng Pilipinas Physics Congress

TALKS AND POSTERS

Investigating the numerical dependencies of the galactic dynamo ... (*poster*) 09/10/2025
Magnetic Fields and Cosmic Rays across Diverse Scales: What's Next?, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, U.S.A.

Investigating the numerical dependencies of the galactic dynamo ... (*invited talk*) 09/11/2025
Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, U.S.A.

Investigating the numerical dependencies of the galactic dynamo ... (*invited talk*) 09/12/2025
University of Massachusetts Dartmouth, North Dartmouth, MA, U.S.A.

The Turbulent Lives of Galactic Magnetic Fields (*invited talk*) 08/11/2025
1st Philippine Space Science and Astronomy Research Conference, Manila, Philippines (online)

Physics Speaks: It's turtles all the way down: lessons we can derive from cosmology (*invited talk*) 2023
Ateneo LeaPs

Ares – Simulating Type Ia Supernovae on Heterogeneous HPC Architectures (*poster*)
11/12-17/2023
Supercomputing 2023, Denver, CO, U.S.A.

Turbulently-driven deflagration-to-detonation transition in near-Chandrasekhar mass white dwarfs (*invited talk*) 06/15/2023
Center for Theoretical Astrophysics, Los Alamos National Laboratory

Turbulently-driven deflagration-to-detonation transition in near-Chandrasekhar mass white dwarfs (*iPoster*) 06/07/2023
American Astronomical Society Meeting 242, Albuquerque, NM, U.S.A.

Three-dimensional simulations of turbulently-driven deflagration-to-detonation transition in near-Chandrasekhar type Ia supernovae (*contributed talk*) 08/15-19/2022
EuroWD22, Eberhard Karls Universität Tübingen, Tübingen, Germany

Turbulently-driven deflagration-to-detonation transition in near-Chandrasekhar mass white dwarfs (*contributed talk*) 04/12/2022
American Physical Society, New York City, NY, U.S.A.

Turbulently-driven deflagration to detonation transition in near-Chandrasekhar mass white dwarfs (*invited talk*) 01/31/2022
Massachusetts Institute of Technology, MA, U.S.A.

Late-time dynamical friction in finite disks (*invited talk*) 02/04/2021
University of Massachusetts Dartmouth, MA, U.S.A.

Steady-state density perturbations induced by a point mass in a finite cylinder (*contributed talk*) 10/19/2020
38th Samahang Pisika ng Pilipinas Physics Conference, Philippines

PROFESSIONAL EXPERIENCE AND SERVICE TO THE FIELD

Graduate Research Assistant 01/2024–present
Department of Astronomy, University of Maryland College Park

· Leads a computational project that explores how magnetic fields evolve in galaxies through large-scale simulations using codes like ART, Arepo, and RAMSES

UMD GRAD-MAP Co-Lead 01/2024–present
Department of Astronomy, University of Maryland College Park

· Co-manages operations and budget, writes grant proposals, designed our new website, and mentored one student (*see* Mentoring)
· Talks presented: How to give an elevator pitch, Python bootcamp (What you need to know to process data from values to plots)
· Official website: `https://www.umdgradmap.org/`

Graduate Teaching Assistant 08–12/2023
Department of Astronomy, University of Maryland College Park

· Teaching assistant for Prof. Lee Mundy's ASTR 101 (Fall 2023)
· Led weekly discussions with a non-technical audience on foundations of astronomy and astrophysics
· Supervised and graded laboratory work of a class with 20 students at a time

Graduate Student Intern 06/2023–08/2023
Los Alamos National Laboratory

· Participant during the 2023 installment of the LANL Co-Design Summer School (est. 2011, http://lanl.github.io/cdss/) where we developed a performance portable code for thermonuclear supernovae

Graduate Teaching Fellow 09/2022–05/2023
Department of Physics, UMass Dartmouth

· Designed (as Instructor on Record) an introduction to astronomy course for a non-technical audience, with topics ranging from history, stellar evolution, galaxies, cosmology and indigenous astronomy
· Graded exams and class output designed to synthesize lectures delivered in class.

Graduate Research Assistant 05/2021–08/2022
Department of Physics, UMass Dartmouth

· Led computational projects on type Ia supernovae that explore (1) a first-principles turbulently-driven explosion mechanism in near-Chandrasekhar mass white dwarfs, (2) the magnetized evolution of white dwarf merger remnants.

· Co-led a paper that illustrated how the the isotope Ti-44 can be used to constrain the progenitor of a type Ia supernova event (*see* Publications)

Graduate Teaching Assistant 01/2021–05/2021
Department of Physics, UMass Dartmouth

· Taught online recitation and laboratory courses in Classical Mechanics

Instructor 1 08/2018–12/2020
National Institute of Physics, UP Diliman

· Taught in-person and online lectures and laboratory classes in Classical Mechanics, Electromagnetism, Physical Electronics, and Computational Physics
· Designed exams and in-class exercises for introduction to classical mechanics and electromagnetism classes
· Co-organized events for the department, served as course group leader for electromagnetism labs

Reviewer (theoretical physics) 2019–2023
Proceedings of the Samahang Pisika ng Pilipinas Physics Conference

University of the Philippines Astronomical Society 2015–present
Associate Member, Education and Research Coordinator (2017)

SCHOOLS ATTENDED

Burgers Program Summer School on Turbulence 06/03—07/2024
University of Maryland Burgers Program for Fluid Dynamics

LANL Co-Design Summer School 05–08/2023
Los Alamos National Laboratory, NM, U.S.A.

MESA Summer School 08/08–12/2022
University of California Santa Barbara, CA, U.S.A

NSF/APS-DPP GPAP Summer school on plasma physics for astrophysicists 06/07–11/2021
Swarthmore College (online)

Deciphering Dark Matter: From Galaxies to the Universe 09/14–25/2020
Institut Teknologi Bandung, Bandung, West Java, Indonesia (on-line)

PRESS

"GRAD-MAP Students, Mentors 'Learn From Each Other' "(August 20, 2025)

PROFESSIONAL REFERENCES

Prof. Benedikt Diemer
Adviser (PhD) and Assistant Professor of Astronomy
`diemer (at) umd (dot) edu`
Department of Astronomy, UMaryland College Park

Prof. Robert Fisher
Adviser (MSc) and Professor of Physics
`robert.fisher (at) umassd (dot) edu`
Department of Physics, UMass Dartmouth

Prof. Ian Vega
Adviser (BS and MS) and Professor of Physics
`ivega (at) nip (dot) upd (dot) edu (dot) ph`
National Institute of Physics, UP Diliman

Prof. Bo Dong
Associate Professor of Mathematics
`bdong (at) umassd (dot) edu`
Department of Mathematics, UMass Dartmouth

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