

MARK IVAN UGALINO

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EDUCATION

University of Maryland, College Park Doctor of Philosophy in Astronomy Department of Astronomy	Fall 2023 – <i>present</i>
University of Massachusetts, Dartmouth Master of Science in Physics College of Engineering	2021 – 2023
University of the Philippines, Diliman Master of Science in Physics National Institute of Physics	2018 – 2020
University of the Philippines, Diliman Bachelor of Science in Physics National Institute of Physics	2013 – 2018
Quezon City Science High School High school diploma	2009 – 2013

SKILLS

Computer Languages Software & Tools	Python, Fortran, C/C++ <i>knowledgeable</i> in Julia and R ART (C, Kravstov et al), RAMSES (Fortran, Teyssier), Arepo (C, Springel), SWIFT (C, Schaller et al), 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: <i>Investigating lunar formation scenarios using SPH</i>
Jin Young Kim (Wake Technical Community College <i>through</i> GRAD-MAP Summer Scholars 2025) Project: <i>Magnetic fields in galaxies</i>
Prabodha Mudalige (MS Physics, UMass Dartmouth <i>now</i> PhD Physics, UT Knoxville) Project: <i>Viscous evolution of astrophysical disks</i>

GRANTS AND RECOGNITIONS

Jacob K. Goldhaber Travel Grant <i>Awarded by UMD Graduate School for participation in “Magnetic Fields and Cosmic Rays across Diverse Scales: What’s Next”</i>	Fall 2025
2023 NASA FINESST Research Grant (USD 148,826.00) <i>Among first 27 selected for award out of 262 submitted proposals (10.3% award rate)</i>	<i>declined</i>
Graduate Dean’s Fellowship (USD 10,000.00) <i>Department of Astronomy, University of Maryland College Park</i>	Fall 2023
Chancellor’s Centennial Engineering Scholarship <i>University of Massachusetts Dartmouth</i>	Spring 2023

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| Graduate Research Award
<i>Department of Physics, University of Massachusetts Dartmouth</i> | 04/27/2022 |
| FIP Distinguished Student Award
<i>American Physical Society</i> | 02/2022 |
| Gawad Direktor para sa Natatanging Bagong Guro
<i>National Institute of Physics, UP Diliman</i> | 12/07/2018 |
- The award was given in recognition of the exemplary performance of a newly hired junior faculty of the institute.
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| Gawad Direktor para sa Natatanging Discussion Teacher
<i>National Institute of Physics, UP Diliman</i> | 12/07/2018 |
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- 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 ... (*invited talk*)** 09/12/2025
University of Massachusetts Dartmouth, North Dartmouth, 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 ... (*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.
- 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 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. 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. Robert Fisher

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

Prof. Bo Dong

Associate Professor of Mathematics
bdong (at) umassd (dot) edu
Department of Mathematics, UMass Dartmouth

Updated: September 2025