BIOGRAPHICAL SKETCH

Marcus DuPont
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(a) Education & Training

New York University	New York, NY	Physics	Ph.D., 2024
	Advisor: Andrew MacFadyen		
	Exploring Novel Mechanisms Behind Astrophysical Transients		
New York University	New York, NY	Physics	MPhil., 2023
Florida State University	Tallahassee, FL	Physics and Astrophysics	B.S., 2019

(b) Research & Professional Experience

Sep 2022 – Jun 2024	Data Science Fellow, LSST-DA Data Science Fellowship Program
Jun 2023 – Aug 2023	Research Fellow, Max Planck Institute for Astrophysics
Jun 2019 – Aug 2019	Research Fellow, Center for Astrophysics | Harvard & Smithsonian
Jun 2018 – Aug 2018	Research Fellow, Center for Astrophysics | Harvard & Smithsonian
Jun 2017 – Aug 2017	Research Fellow, Center for Astrophysics | Harvard & Smithsonian

(c) Skills

Programming	CUDA, HIP, C++, C, Python
Web	HTML, CSS, LESS
Language	English, French, Haitian-Creole
Database	SQL, MangoDB

(d) Publications

1. M. DuPont, C. Shen, and N. A. Murphy. Comparative Analysis of the Solar Wind: Modeling Charge State Distributions in the Heliosphere. *arXiv e-prints*, page arXiv:2012.12297, Dec. 2020.
2. M. DuPont and J. W. Murphy. Fundamental physical and resource requirements for a Martian magnetic shield. *International Journal of Astrobiology*, 20(3):215–222, June 2021.
3. M. DuPont, A. MacFadyen, and J. Zrake. Ellipsars: Ring-like Explosions from Flattened Stars. ApJL, 931(2):L16, June 2022.
4. M. DuPont, A. MacFadyen, and R. Sari. On the Theory of Ring Afterglows. ApJ, 957(1):29, Nov. 2023.
5. M. DuPont. SIMBI: 3D relativistic gas dynamics code. Astrophysics Source Code Library, record ascl:2308.003, Aug. 2023.
6. M. DuPont and A. MacFadyen. Stars Bisected by Relativistic Blades. ApJL, 959(2):L23, Dec. 2023.
7. M. DuPont, A. MacFadyen, and S. E. de Mink. Explosions in Roche-lobe Distorted Stars: Relativistic Bullets in Binaries. *ApJ*, 964(1):56, Mar. 2024.
8. M. DuPont, A. Gruzinov, and A. MacFadyen. Strong Bow Shocks: Turbulence and an Exact Self-similar Asymptotic. ApJ, 971(1):34, Aug. 2024.

9. M. DuPont and A. MacFadyen. Did Binary Neutron Star Merger GW170817 Leave Behind a Long-lived Neutron Star? ApJL, 971(1):L24, Aug. 2024.

(e) Awards & Honors

Lyman Spitzer Jr. Fellowship	Princeton University	2023
Future Faculty in the Physical Sciences Fellowship	Princeton University	2023
SCEECS + KIPAC Fellowship (declined)	Stanford University	2023
Burke Fellowship (declined)	Caltech	2023
Kavli Summer Program in Astrophysics	University of California, Santa Cruz	2023
James Arthur Graduate Associate Fellowship	New York University	2023
Outstanding Graduate Student Instructor Award	New York University	2022
KITP Graduate Fellowship	Kavli Institute for Theoretical Physics	2022
James Arthur Graduate Associate Fellowship	New York University	2021
AAS Travel Grant	American Astronomical Society	2017
Silver Garland in Mathematics	The Ledger Media Group	2014

(f) Programs & Committees

National Society of Black Physicists	2020
American Astronomical Society	2017

(g) Invited Presentations

1. M. DuPont. "Death Stars: Ring-explosions from flattened stars"', May 6, 2022. Caltech: Theoretical AstroPhysics Including Relativity (TAPIR).
2. M. DuPont. "Death Rays: Relativistic Beams from Roche Lobe Filling Stars"', Aug 5, 2023. Max-Planck-Institut für Astrophysik (MPA).
3. M. DuPont. "Death Stars: Discerning Astrophysical Transients From Non-Conventional Explosion Geometries"', Sep 21, 2023. Flatiron Institute: Center for Computational Astrophysics (CCA).
4. M. DuPont. "Astrophysical implications of non-conventional explosion geometries"', Nov 9 2023. Institute for Advanced Study (IAS).
5. M. DuPont. "The Life and Death of Stars"', Feb 7 2024. Bookclub Bar (NYC).
6. M. DuPont. "Explosions in Roche-libe Distorteed Stars: Relativistic Bullets in Binaries"', May 8 2024. Purdue University (IN).

(h) Invited Lectures

1. M. DuPont. "An Introduction to Numerical Hydrodynamics", March 14 2024. Flatiron Institite: Center for Computational Astrophysics (CCA).

(i) Synergistic Activities

1. Popular Media
   - LinkNYC (Apr, 2023) — Cosmic Curiosity, My research was featured throughout the entire city of New York through interactive visual kiosks showcasing images from my high-resolution simulations of exploding stars.
   - AAS NOVA (Mar, 2024) — How to Slice a Star, My research on relativistic blades was highlighted by the enthusiast-centered arm of the American Astronomical Society.

2. Teaching Assistant
   - FSU (Aug, 2018 - Dec, 2018) — Physics Problem Solving
     – Developed a curriculum that was focused around helping students build physics intuition by means of order-of-magnitude focused exercise
   - NYU (Aug, 2021 - Dec, 2021) — Computational Physics
     – Taught with a focus on signal processing, dynamics, and optimization techniques.
3. Mentor
   - FIRST Lego Robotics (Aug, 2013 - Oct, 2013)
     – Teach kids simple coding methods utilizing Arduino boards coupled with the `Scratch` build block programming scheme. These robots were then used in competition with other in-state institutions.
   - STEM Scholarbotics (Aug, 2013)
     – Help students virtually perform surgery using digital Davinci arm simulation programs to provide hands-on experience with cutting edge technology.