

# GABRIEL CASABONA

DOE CSGF Fellow

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gcasabona.github.io

## RESEARCH INTERESTS

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- Compact binary stellar object mergers, type Ia supernovae, kilonovae, gamma ray bursts
- Magnetohydrodynamics, turbulence, r-process nucleosynthesis, general relativity, cosmology

## EDUCATION

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**Northwestern University**

June 2025

PhD in Physics

**University of Massachusetts Dartmouth**

May 2019

M.S. in Physics

Research Assistant

July 2018 - Present

Teaching Assistant

September 2017 - Present

**Florida International University**

May 2017

B.S. in Physics

Resident Assistant

June 2015 - May 2017

## PUBLICATIONS

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Mozumdar, P., Fisher, R., & Casabona, G (Jul 2018). *Carbon Detonation Initiation in Turbulent Electron-Degenerate Matter*. arXiv:1807.03786 (in submission to ApJ)

## RESEARCH EXPERIENCE

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**University of Massachusetts Dartmouth**

October 2017 - May 2019

- Worked with **Robert Fisher** to analyze the role of turbulence in the detonation of carbon in electron-degenerate matter. The FLASH4 code was used to solve the hydrodynamics and nuclear burning, motivated by the double-degenerate channel of Type Ia Supernovae.

## PRESENTATIONS

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Casabona, G (Mar 2019). *Detonation Initiation in Type Ia Supernovae*.

APS March 2019. Boston, Massachusetts

Casabona, G (Jan 2019). *Detonation Initiation in Type Ia Supernovae*.

233<sup>rd</sup> Meeting of the AAS. Seattle, Washington

Casabona, G (Nov 2018). *Carbon Detonation Initiation in Turbulent Electron-Degenerate Matter*.

APS Bridge/NMC Conference 2018. Stanford University

Casabona, G (Nov 2018). *Carbon Detonation Initiation in Turbulent Electron-Degenerate Matter*.

APS New England 2018. University of Massachusetts Dartmouth

Casabona, G (Jul 2018). *Carbon Detonation Initiation in Turbulent Electron-Degenerate Matter*.

IHPCSS. Technical University of Ostrava, Czech Republic

Casabona, G (Apr 2018). *Carbon Detonation Initiation in Turbulent Electron-Degenerate Matter*.

APS April 2018. Columbus, Ohio

## CONFERENCES & WORKSHOPS

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Neutron Star Mergers for Non-Experts: GW 170817 in the Multi-Messenger Astronomy and FRIB Eras. (May 2018). Michigan State University

NuGrid/JINA/ChETEC School: Software Tools for Simulations in Nuclear Astrophysics. (Sep 2018). University of Hull, United Kingdom

## PROGRAMMING

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Proficient in Python for the use of data analysis and visualization.

Proficient with the Unix command system to maneuver in a computer terminal.

Experience with Fortran and C for scientific computing.

Experience with writing scientific documentation using  $\text{\LaTeX}$ .

Advanced knowledge in High-Performance Computing techniques:

- Parallel Processing, MPI, OpenMP, Parallel I/O, Scientific Visualization

## OUTREACH

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Physics Honors Society ( $\Sigma\Pi\Sigma$ )

- Casabona, G & Tumeo, B., *et al* (Aug 2016). *Minority and Women in S.T.E.M. Outreach*. Women in S.T.E.M. Living Learning Community, Florida International University

It's On Us/ Sexual Assault Awareness

- Casabona, G., & Nephew, A. (Jul 2016). *Let's Talk About Sex*. Office of Residential Life, Florida International University

## EXPERIENCE

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### STEM Learning Lab

September 2017 - December 2017

*Tutor*

*UMass Dartmouth*

· Facilitate the understanding of materials in the following subjects:

- Introductory Physics I-II, Quantum Mechanics, Thermodynamics, Electrodynamics
- Algebra, Pre-Calculus, Trigonometry, Calculus I-III, Differential Equations

### ARC Learning Center

September 2016 - May 2017

*Tutor*

*FIU*

· Facilitate the understanding of materials in the following subjects:

- Introductory Physics I-II, General Chemistry I-II
- Algebra, Pre-Calculus, Trigonometry, Calculus I-III, Differential Equations

## ORGANIZATION MEMBERSHIPS

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Society of Physics Students

Physics Honors Society ( $\Sigma\Pi\Sigma$ )

American Astronomical Society

National Society of Black Physicists

APS Bridge Program