Orion Guiffreda

CONTACT INFORMATION

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RESEARCH INTERESTS

Gamma ray bursts, galactic transients, gravitational wave events, active galactic nuclei, starburst galaxies

EDUCATION

May 2023

B.S. in Astronomy
University of Maryland, College Park, MD
GPA: 3.70/4.00 | President's Scholarship Recipient

RESEARCH & WORK EXPERIENCE

Aug. 2023 – Present

Image Processing & Photometry Pipeline for PRIME Telescope
Postbaccalaureate Researcher at NASA Goddard Space Flight Center
Advisor: Alexander Kutyrev, Ph.D., Department of Astronomy

- Constructed FITS image processing and photometry pipeline for the near infrared PRIME telescope, with continual refinements.
- Published over 25 GCN Circulars and ATels reporting photometric measurements of transient afterglows.
- Developing automated photometric data reduction for PRIME observations, to produce and analyze results without human intervention.
- Developing a local SQL database for PRIME data, to provide easy access for collaborators.

Feb. 2023 – May 2023

UV Scattered Light in M82 Starburst
Astronomy Research Assistant at UMD
Advisor: Sylvain Veilleux, Ph.D., Department of Astronomy

- Conducted photometric analysis of HST FITS images.
- Removed stellar emission and analyzed UV scattering in M82 cone through reprojection and calculation of correction factors in four filters.
- Created images utilized in accepted HST proposal for Cycle 31.

Jan. 2023 – May 2023

Teaching Assistant – ASTR121: Introductory Astrophysics II lab
Astronomy Undergraduate Teaching Assistant at UMD
Professor: Stuart Vogel, Professor Emeritus, Department of Astronomy

- Taught weekly two-hour lab periods for freshman and sophomore students.
- Provided guidance and support to students for formal labs and lab reports.
- Graded 8 biweekly, 15-page lab reports, 24 bi-weekly pre-lab assignments, and 8 bi-weekly peer review assignments.

Jan. 2023

ZTF Survey Development for Observational Astronomy
Astronomy Research Assistant at UMD
Advisor: Melissa Hayes-Gehrke, Ph.D., Department of Astronomy

Developed non-native features using the ZTF online survey, including object-type query and multi-light curve download.
Improved data-collecting efficiency and ease of use for users of ZTF online survey.

Aug. 2021 – Dec. 2021, Aug. 2022 – Dec. 2022

Teaching Assistant – ASTR310: Observational Astronomy lab
Astronomy Undergraduate Teaching Assistant at UMD
Professor: Melissa Hayes-Gehrke, Ph.D., Department of Astronomy

Taught weekly two-hour lab periods for junior and senior students.
Provided guidance and support to students for formal labs and research projects.
Graded 30 weekly in-class assignments and 15 labs, along with 30 midterms and final exams.

June 2021 – Aug. 2021

Observational Astronomy Class Development
Advisor: Melissa Hayes-Gehrke, Ph.D., Department of Astronomy

Queried, analyzed, and compared image data and light curves from IRSA in various surveys (2MASS, PTF, ZTF).
Developed 10-page lab manual for current use in observational astronomy class.
Adapted class materials and learning goals from iPTF to ZTF online survey.

CONFERENCE TALKS & PRESENTATIONS

June 2025

AAS 246 iPoster Session

iPoster presentation on the history of reported transient events by PRIME, along with outlining improvements accomplished since AAS245 in the continued development for the PRIME pipeline and updated prospective goals: "*Visiting the Transient Zoo: Exploring Near Infrared Transient Counterparts and the Ongoing Photometric Pipeline Development by PRIME Telescope"*, **303.02**

Jan 2025

AAS 245 iPoster Session

iPoster presentation on the current state of development for the PRIME image processing and photometric pipeline, along with future goals: "*Taming Transients through the Development of a Photometric Pipeline by PRIME Telescope*", **360.02**

PUBLICATIONS

General Coordinates Network Circulars & Astronomer's Telegrams

Lead author on over 10 and co-author on over 30 GCN Circulars and ATels (2023-2025) reporting upper limits and detections on NIR transient follow-ups and candidate GW events.

Lead author reports:

[1] **Guiffreda, O.**, Durbak, J., Kutyrev, A. S., Passaleva, N., El Kabir, M., Troja, E., and Cenko, S. B. *General Coordinates Network,* **41943**, 22 September, 2025.
[2] **Guiffreda, O.**, Durbak, J., Troja, E., Kutyrev, A. S., and Cenko, S. B. *General Coordinates Network,* **39670**, 11 March, 2025.
[3] **Guiffreda, O.**, Durbak, J., Troja, E., Kutyrev, A. S., and Cenko, S. B. *General Coordinates Network,* **39705**, 13 March, 2025.
[4] **Guiffreda, O.**, Durbak, J., Atri, S., Kutyrev, A. S., Troja, E., De, K., and Cenko, S. B. *General Coordinates Network,* **37736**, 08 October, 2024.
[5] **Guiffreda, O.**, Durbak, J., Atri, S., Kutyrev, A. S., Troja, E., De, K., and Cenko, S. B. *General Coordinates Network,* **37303**, 26 August, 2024.
[6] **Guiffreda, O.**, Atri, S , Durbak, J., Kutyrev, A. S., Troja, E., De, K., and Cenko, S. B. *General Coordinates Network,* **37212**, 21 August, 2024.
[7] **Guiffreda, O.**, Durbak, J., Kutyrev, A. S., Troja, E., De, K., Cenko, S. B., and Atri, S. *General Coordinates Network,* **37153**, 12 August, 2024.
[8] **Guiffreda, O.**, Durbak, J., Kutyrev, A. S., Troja, E., De, K., Cenko, S. B., and Atri, S. *General Coordinates Network,* **37118**, 09 August, 2024.
[9] **Guiffreda, O.**, Durbak, J., Troja, E., Hamada, R., Nagano, T., Kutyrev, A. S., Suzuki, D., Sumi, T., De, K., and Cenko, S. B. *General Coordinates Network,* **36306**, 25 April, 2024.
[10] **Guiffreda, O.**, Durbak, J., Kutyrev, A. S., Troja, E., De, K., and Cenko, S. B. *General Coordinates Network,* **35956**, 18 March, 2024.
[11] **Guiffreda, O.**, Durbak, J., Kutyrev, A. S., Troja, E., De, K., and Cenko, S. B. *General Coordinates Network,* **35708**, 02 February, 2024.
[12] **Guiffreda, O.**, Durbak, J., Kutyrev, A. S., Troja, E., De, K., and Cenko, S. B. *General Coordinates Network,* **35633**, 25 January, 2024.

Co-author on ~20 additional reports on NIR transient and candidate GW follow-ups.

HONORS / AWARDS / GRANTS

2018	University of Maryland President's Scholarship
2018-2022	University of Maryland Dean's List
2023	Outstanding Undergraduate Teaching Assistant Award

MEMBERSHIPS / AFFILIATIONS

2018 – May 2023	AstroTerps – University of Maryland Astronomical Society

RELATED COURSEWORK

Calculus I-III, Mechanics (with lab), Electricity & Magnetism (with lab), Waves & Optics (with lab), Modern Physics, Introductory Astrophysics, Observational Astronomy (with lab), Radio Astronomy, Galaxies, Stellar Astrophysics, Quantum Mechanics, Statistical Thermodynamics.

SKILLS / CERTIFICATIONS

Extensive knowledge of Python, MATLAB, SAO Image DS9, Markdown, Microsoft Suite, Apple Suite. Intermediate knowledge of LaTeX, Ubuntu, SQL.