

# Nora Field Sherman

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## APPOINTMENTS & EDUCATION

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| <b>Boston University</b><br><i>Postdoctoral Associate, Institute for Astrophysical Research</i>                     | <b>August 2024 – current</b> |
| <b>University of Michigan</b><br><i>Ph.D. in Physics</i>                                                            | <b>July 2024</b>             |
| <b>University of Illinois at Urbana-Champaign</b><br><i>Bachelor of Science with Highest Distinction in Physics</i> | <b>May 2019</b>              |
| <b>McHenry County College</b><br><i>Associate of Science with High Honors</i>                                       | <b>May 2016</b>              |

## TALKS

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### Conferences & Invited Talks

- The Dark Energy Bedrock All-Sky Supernovae Survey*, Baylor University Physics & Astronomy Colloquium, March 2025
- The Dark Energy Bedrock All-Sky Supernovae Survey*, RSAA Seminar and Colloquium Series at Australian National University, February 2025
- The Dark Energy Bedrock All-Sky Supernovae Survey*, Cosmic Flows 2025, February 2025
- The Dark Energy Bedrock All-Sky Supernovae Survey*, NOIRLab South Colloquium Series, January 2025
- Hunting for the Screams from the Stellar Graveyard*, High Throughput Computing (HTC 24), July 2024
- DESGW Follow-Up Program*, American Astronomical Society 243 Winter Meeting, January 2024
- Bright Mergers in a Dark Universe: The New Searches for Optically Bright Gravitational Wave Progenitors*, Duke University Cosmology Seminar, December 2023
- Finding Optical Counterparts to Binary Black Holes*, São Paulo Advanced School on Multi-Messenger Astrophysics, May 2023
- Maximizing The Detection of Optical Counterparts in DESGW Follow-ups*, Duke University Cosmology Group Meeting, February 2023
- Multi-Messenger Search for  $H_0$  Using Optical Counterparts to Gravitational Wave Events*, University of Michigan Physics Department Colloquium, October 2022

*Searching for Kilonovae: Using DECam and the DESGW Data Pipeline in Pursuit of Optical Counterparts to Gravitational Wave Events*, DECam at 10 Years, September 2022

*Searching for Electromagnetic Counterparts in DESGW Follow-up Data of Binary Black Hole Events*, American Physical Society April Meeting, April 2022

### **Collaboration Meetings**

*The DESGW Search for Optical Counterparts in LVK O4*, Dark Energy Survey Collaboration Meeting at University of Illinois at Urbana-Champaign, October 2023

*The Dark Energy Survey Pursuit of Optical Counterparts to Gravitational Wave Events*, Dark Energy Survey Collaboration Meeting at Portsmouth University, January 2023

*The BBH Global Analysis*, Dark Energy Survey Mini-Collaboration Meeting, January 2022

## **SCIENCE COLLABORATIONS**

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**Dark Energy Survey**, Member/Builder **May 2018 – current**

**Legacy Survey of Space and Time Dark Energy Science Collaboration**, Member **March 2023 – current**

**DECam Local Volume Exploration Survey**, Member **May 2018 – current**

**ATLAS Collaboration at CERN**, Member **January 2017 – May 2018**

## **RESEARCH**

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**Brout Group** **August 2024 – current**

*Postdoctoral Associate* *Boston, MA, USA*

- Lead the processing of 500+ low redshift supernovae for the Dark Energy Bedrock All-Sky Supernovae (DEBASS) program.
- Observe both in-person at the NOIRLab CTIO facility and remotely for the DECam Alliance for Transients.
- Contribute to efforts to port Dark Energy Survey software for transient detection to resources for the Legacy Survey of Space and Time (LSST).
- Conduct the Dark Energy Survey Gravitational Wave group (DESGW) in efforts to follow-up on optical counterparts to gravitational wave event, in continuation of the work described below.
- Work as convenor for the newly created Time Domain Working Group in the Dark Energy Survey supporting efforts in gravitational wave, type Ia supernovae, and solar system science within the collaboration.

**Soares-Santos Lab** **August 2019 – July 2024**

*Ph.D. Candidate* *Ann Arbor, MI, USA*

- Aided in the search and study of electromagnetic counterparts to gravitational wave (GW) events with DESGW.
- Led analysis of optical data from GW events in the fourth observing run (O4) of the LIGO/Virgo/Kagra collaboration (LVK).

- Modeled optical emission for binary black hole mergers and study the conditions that would facilitate this emission and their potential hosts.
- Developed new computational tools and methods to analyze optical transients.
- Led and organize DESGW meetings, including collaboration meeting parallels and talks.
- Completed research and discovery analysis for supernovae for DEBASS.
- Observed with the Dark Energy Camera (DECam) at the Cerro Tololo Inter-American Observatory for 8 nights for the DECam Local Volume Exploration Survey (DELVE).

## **Brandeis University**

**August 2019 – July 2020**

*Ph.D. Student*

*Boston, MA, USA*

- Worked on DESGW efforts during O3 assisting in follow-up analysis.
- Transferred to University of Michigan to continue researching in the Soares-Santos Lab.

## **Fermi National Accelerator Laboratory**

**May 2019 – August 2019**

*Intern*

*Batavia, IL, USA*

- Developed a program in Bash and Python to calculate the nightly visibility of the Dark Energy Camera and to make readily accessible any preexisting images in the determined visibility ranges with which DESGW can compare search images from active follow-ups to GW events.
- Ensured compatibility of the DESGW Image Processing pipeline on Scientific Linux 7 (SL7) as Fermilab nears withdrawing support for the pipeline's original operating system, SL6.
- Organized summer student and intern talk sessions to offer participants experience in presenting research and results and communicating science to non-expert and general audiences.

## **Fermi National Accelerator Laboratory**

**May 2018 – August 2018**

*Intern*

*Batavia, IL, USA*

- Contributed to the DESGW collaboration by preparing data selection and refinement methods for the next LIGO run.
- Automated and improved post-processing in the DESGW data pipeline using Python and Bash scripting.
- Developed website to share DESGW data with other contributors.

## **Martinez Outschoorn High Energy Physics Research Group**

**January 2017 – May 2018**

*Undergraduate Research Assistant*

*Urbana, IL, USA*

- Analyzed data from the ATLAS Experiment at CERN using ROOT data analysis framework and C++.
- Validated “truth information” from Monte Carlo simulations.
- Implemented a rigorous selection sequence (cutflow) to datasets, refining them for further review.
- Studied separation ( $\Delta R$ ) of granddaughter particles in exotic Higgs decays.
- Drafted preliminary “ATLAS Note” for publication on CERN databases.

## OSERVEING EXPERIENCE

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### Onsite:

8 nights of observing between 07.12.2023 and 07.22.2023 with the Dark Energy Camera for DELVE CTIO, La Serena, Chile

3 nights of observing between 01.24.2024 and 02.01.2024 with the Dark Energy Camera for DEBASS CTIO, La Serena, Chile

### Remote:

Target of Opportunity observing for DESGW follow-up in during LVK O3 and O4 with the Dark Energy Camera

Multiple nights of observing with the Dark Energy Camera for DEBASS

## GRADUATE STUDENTS MENTORED

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**Rujuta Purohit**, Boston University, 2025 – current. PI: Dillon Brout. Simulations for quantifying variability in the focal plane of the Nancy Grace Roman Space Telescope.

**Maria Acevedo**, Duke University, 2022 – 2025. PI: Daniel Scolnic. Research and discovery of supernovae and pipeline development for their detection.

**Isaac McMahon**, University of Zurich, 2022 – 2025. PI: Marcelle Soares-Santos. Gravitational wave optical follow-up data analysis.

**Sean MacBride**, University of Zurich, 2023 – 2025. PI: Marcelle Soares-Santos. Negotiating large collaboration structure.

**Thomas Ruch**, University of Michigan, 2022 – 2024. PI: Marcelle Soares-Santos. Website development and integration for optical follow-up to gravitational wave events.

**Simran Kaur**, University of Michigan, 2023 – 2024. PI: Marcelle Soares-Santos. Background and signal simulation for gravitational wave optical follow-up

## UNDERGRADUATE STUDENTS MENTORED

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**Tristan Bachmann**, Summer 2019 – 2022 University of Chicago. Identifying electromagnetic counterparts to binary black hole mergers.

**Elise Kesler**, 2022 – 2024 University of Michigan. Gravitational wave optical follow-up data pipeline development and observing strategy ingest and execution.

**Dana Yaptangco**, Summer 2022 University of Florida. Gravitational wave optical follow-up data pipeline development.

## TEACHING

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### University of Michigan

*Graduate Student Instructor*

**August 2020 – May 2021**

*Ann Arbor, MI, USA*

- Teach introductory physics labs for life science students, assisting participants with virtual experiments and data analysis.

- Host office hours open to students of all early physics courses through the Physics Department Help Room.
- Facilitate engagement through a vibrant remote learning environment.

## **Brandeis University**

**August 2019 – August 2020**

*Graduate Teaching Assistant*

*Waltham, MA, USA*

- Led weekly recitation sections to guide students through algebra-based physics problems.
- Conducted comprehensive review sessions for exam preparation.
- Collaborated with course professor and fellow teaching assistants to guarantee effective and cohesive teaching.
- Provided both one-on-one and group tutoring for all physics students in a variety of courses through the Physics Department Resource Room.

## **University of Illinois at Urbana-Champaign**

**August 2017 – May 2019**

*Classroom Aide in the Department of Computer Science*

*Urbana, IL, USA*

- Assisted students with Python and MATLAB coding challenges during laboratory sessions and office hours.
- Collaborated with teaching assistants and other aides to ensure excellence during learning periods.

## **McHenry County College**

**December 2015 – May 2016**

*Supplemental Instruction Leader in Math Intern at the Sage Learning Center*

*Batavia, IL, USA*

- Supported elementary algebra students during in-class problem-solving periods and office hours.
- Prepared worksheets, resource lists, and other material to aid students' mastery of course topics.

## **HONORS, LEADERSHIP, & OUTREACH**

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### **Independent Honors**

- DES Builder Status, achieved by accomplishing 2 years FTE on infrastructure work for the collaboration, December 2022

### **Independent Outreach**

- Astronomy on Tap: Boston Organizer, January 2026 – current
- Astronomy on Tap: Boston lecture “The Dance of Death: How Mergers of Dead Star Remnants Help Us Probe the Make-Up of the Universe”, March 2026
- Engaged with 8th grade STEM students of Tara Sain for Celebration of Women in STEM kickoff event at the Township of Ocean Schools Intermediate School, Oakhurst, NJ, February 2023
- Spoke to 2nd grade students of Renee Grady at Chickering Elementary, Dover, MA, April 2020

### **Boston University**

- LSST DESC: Boston Local Organizing Committee member, February – July 2026
- 2nd Annual Lightning Talk Competition, How Stellar Death Can Help Us Read the Music of the Universe (first place), September 2024

## University of Michigan

- WISE-RP Night (Women in STEM Outreach Event), March 2023 and April 2024
- Scientist Spotlight at the University of Michigan Museum of Natural History, multiple dates
- University of Michigan Museum of Natural History Planetarium Operator
- University of Michigan Museum of Natural History Science Communication Fellow
- RELATE STEM Communication Fundamentals Workshop Participant
- Community of Physicists for Inclusion and Equity Executive Board Member
- University of Michigan APS Chapter Founding Member
- Physics DEI Committee Member

## University of Illinois at Urbana-Champaign

- College of Liberal Arts and Sciences James Scholar
- Department of Physics Peer Mentor
- Physics Student Advisory Board Member
- Vice President and Co-founder of Physics International
- Kevin Allwin Shrote Merit Scholarship Recipient
- Peter and Susan Schaeffer Merit Scholarship Recipient
- Delta Phi Alpha National German Honor Society
- Phi Kappa Phi Honor Society

## McHenry County College

- 2015-16 All-USA Community College Academic Team Nominee and All-Illinois Team Member
- Phi Theta Kappa Honor Society
- Jane S. Erickson Endowment Merit Scholarship Recipient
- Raymond C. Johnson Memorial Merit Scholarship Recipient
- Silver Cord (Student Service Learning Award)

## ADDITIONAL SKILLS

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**General Computer:** Python, Bash, C++, MATLAB, SQL, HTML/CSS, Java, OriginPro, LoggerPro, Microsoft Office Suite, Google Docs Editors Suite

**Physics/Cosmology Software:** SuperNova ANalysis package (SNANA), ROOT Data Analysis Framework

**Machine Learning and Artificial Intelligence:** Developed and worked on LSST alerts-based project during the Rubin Alerts SkAI Hackathon (April 2026); Participated in the EDUCADO–MWGaiaDN Training School on Astro-AI and Machine Learning (March 2026); Developed LSTM algorithm to classify tidal disruption events for the MALLORN Astronomical Classification Challenge (January 2026); Created a CNN to detect galaxies in image stamps for final project in graduate level coursework (2021)

**Languages:** English (*native*), Portuguese (*intermediate; actively learning*), German (*basic; previous intermediate knowledge*), American Sign Language (*basic*)

## PUBLICATIONS

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The Dark Energy Bedrock All-Sky Supernova Program: Motivation, Design, Implementation, and Preliminary Data Release, **N F. Sherman** *et al.* 2026 *ApJ* 1002 146

- Led paper analysis and program data processing.

DELVE Milky Way Satellite Galaxy Census. I. Satellite Population and Survey Selection Function in DES, DELVE, and Pan-STARRS, C. Y. Tan *et al.* 2026 *ApJ* 1000 87

- Provided guidance science case motivation.

Dark Energy Survey Year 6 Results: Weak Lensing and Galaxy Clustering Cosmological Analysis Framework, D. Sanchez-Cid *et al.* 2026 arXiv:2601.14859

- DES Builder.

Dark Energy Survey Year 6 Results: MagLim++ Lens Sample Selection and Measurements of Galaxy Clustering, N. Weaverdyck *et al.* 2026 arXiv:2601.14484

- DES Builder.

The Dark Energy Bedrock All-Sky Supernova Program: Cross Calibration, Simulations, and Cosmology Forecasts, M. Acevedo *et al.* 2026 *ApJ* 996 7

- Helped process the observed data and formulate the calibration.

TITAN DR1: An Improved, Validated, and Systematically-Controlled Recalibration of ATLAS Photometry toward Type Ia Supernova Cosmology, E. Marlin *et al.* 2025 arXiv:2512.21903

- Assisted in data analysis.

A Joint Search for the Electromagnetic Counterpart to the Gravitational-Wave Binary Black-Hole Merger Candidate S250328ae with the Dark Energy Camera and the Prime Focus Spectrograph, H. Zhang *et al.* 2025 arXiv:2508.00291

- Informed and assisted in follow-up and candidate vetting.

Discovery and Spectroscopic Confirmation of Aquarius III: A Low-mass Milky Way Satellite Galaxy, W. Cerny *et al.* 2025 *ApJ* 979 164.

- Performed observing of relevant targets.

Designing an Optimal Kilonovae Search using DECam for Gravitational Wave Events, C. R. Bom, *et al.* 2024, *ApJ* 960 122.

- Provided expertise on the strategy code used in O3, mentoring new group members and co-developing a new strategy for O4.

SOAR/Goodman Spectroscopic Assessment of Candidate Counterparts of the LIGO-Virgo Event GW190814, D. Tucker, *et al.* 2021, *ApJ* 929 115.

- Worked on night-of follow-up and data analysis for the event using the DESGW Search and Discovery pipeline.
- Provided ranked list of candidates for spectroscopic observations.

The Gravity Collective: A Search for the Electromagnetic Counterpart to the Neutron Star-Black Hole Merger GW190814, C. D. Kilpatrick, *et al.* 2021, *ApJ* 923 258.

- Provided reduced images which were used in combination with data from other telescopes in this analysis.

A DESGW search for the electromagnetic counterpart to the LIGO/Virgo gravitational wave binary neutron star merger candidate S190510g, DES Collaboration, Garcia, A., et al. 2020 *ApJ* 903 75.

- Responsible for nightly image processing during some nights of observations. Performed candidate vetting for the analysis.

Constraints on the physical properties of S190814bv through simulations based on DECam follow-up observations by the Dark Energy Survey, Morgan, R., et al. 2020 *ApJ* 901 83.

- Responsible for nightly image processing during 3+ nights of observations. Performed candidate vetting which resulted in 23 candidates reported to the community in 6 GCN circulars. Conducted reprocessing of the data and cross-checks for the offline analysis.

The updated DESGW processing pipeline for the third LIGO/VIRGO observing run, Herner, K., et al. 2020 *EPJ Web of Conferences* 245 01008.

- Wrote a post-processing tool to enable candidate vetting. Implemented updates to the processing pipeline to ensure compatibility with new grid environment.

Optical follow-up of gravitational wave triggers with DECam during the first two LIGO/VIRGO observing runs, Herner, K., et al. 2020 *Astronomy and Computing* 33 100425.

- Conducted tests of individual difference imaging pipeline steps.