

# Maude Gull

PhD Candidate | [mgull@berkeley.edu](mailto:mgull@berkeley.edu) | <https://maudegull.github.io/> | OrCID: [0000-0003-3747-1394](https://orcid.org/0000-0003-3747-1394)

## RESEARCH SUMMARY

I observe and investigate **metal-poor massive stars in the Local Group** to understand the processes that govern their evolution, final fates and influence on their environment across the Universe. In particular, I am quantifying the interplay between **metallicity, mass, mass-loss, rotation and binarity** of metal-poor massive stars during their lifetime. My interdisciplinary approach uses **machine learning and Bayesian Inference** and combines **panchromatic photometry** and **spectroscopy** to advance our observational knowledge of stellar astrophysics.

## EDUCATION

<b>University of California, Berkeley</b>   <b>Ph.D.</b> in Astrophysics	08/2019 - 08/2025
Thesis: A Panchromatic Study of the Metal-poor Massive Stars in the Local Group	
<b>University of California, Berkeley</b>   <b>M.A.</b> in Astrophysics	08/2019 - 12/2020
<b>Massachusetts Institute of Technology</b>   <b>B.Sc.</b> in Physics.	08/2015 - 06/2019
<b>Massachusetts Institute of Technology</b>   <b>B.Sc.</b> in Mathematics	08/2015 - 06/2019

## RESEARCH POSITIONS

<b>Postdoctoral Fellow</b> , Carnegie-Caltech Brinson Fellow, Carnegie Observatory	09/2025-present
<b>Postdoctoral Fellow</b> , Carnegie-Caltech Brinson Fellow, Caltech	09/2025-present
<b>Graduate</b> Student Researcher, Dept. of Astronomy, UC Berkeley	08/2019-08/2025
<i>Metal-poor massive stars in the Local Group (Advisor: Daniel R. Weisz)</i>	
<b>Graduate</b> Visiting Student, Inst. for Computational Cosmology, Durham University	08/2022-10/2022
<i>KCWI view of Massive Stellar Clusters (Advisor: Anna Mcleod)</i>	
<b>Undergraduate</b> Researcher, MIT	
<i>Neutron-capture in Metal-poor stars in the Milky Way halo (Advisor: Anna Frebel)</i>	06/2016 - 06/2019
<i>Formation of primordial black holes during Inflation (Advisor: Alan Guth)</i>	06/2017 - 06/2019
<i>Performance Optimization of the Carnegie PFS (Advisor: Jennifer Burt)</i>	08/2017 - 12/2017

## PUBLICATIONS

[Link to ADS Library](#)

- **Gull, Maude**; Weisz, Daniel R.; et al. (2025) *A Low Metallicity Massive Contact Binary Star System Candidate in WLM identified by Hubble and James Webb Space Telescope imaging*. The Astrophysical Journal. Volume 986 (1).
- **Gull, Maude**; Weisz, Daniel R.; et al. (2022) *A Panchromatic Study of Massive Stars in Extremely Metal-Poor Local Group Dwarf Galaxy LeoA*. The Astrophysical Journal. Volume 941 (2).
- **Gull, Maude**; Frebel, Anna; et al. (2020) *R-process-rich Stellar Streams in the Milky Way*. The Astrophysical Journal. Volume 912 (1).

- **Gull, Maude;** Frebel, Anna; Cain, Madelyn; et al. (2018). *Discovery of the first metal-poor star with a combined r- and s-process element signature*. The Astrophysical Journal. Volume 862 (2).
- Choi Yumi, ..., **Gull, Maude;** et al. (2025). *The Impact of UV Inclusion in Deriving Star Formation Histories of Low-mass Dwarf Galaxies*. The Astrophysical Journal. Volume 169 (5).
- Gilbert, Karoline; ...; **Gull, Maude;** ...; et al. (2025). *The Local Ultraviolet to Infrared Treasury I. Survey Overview of the Broadband Imaging*. The Astrophysical Journal Supplement Series. Volume 276 (1)
- Yamaguchi, Natsuko; El-Badry, Kareem; Rodriguez, Antonio C. ; **Gull, Maude;** et al. (2023). *Sodium enhancement in evolved cataclysmic variables*. Monthly Notices of the Royal Astronomical Society. Volume 524 (1).
- Cain, Madelyn; Frebel, Anna; **Gull, Maude;** et al. (2018). *Chemical abundances for a trio of r-process-enhanced stars - one strong, one moderate, and one mild*. The Astrophysical Journal. Volume 864 (1).

## AWARDED TELESCOPE TIME

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Observation Experience: 2 nights on MIKE (Magellan), 4 nights on LLAMAS (Magellan), 2 nights on FIRE (Magellan), 9 nights on LRIS (KECK), 4 nights on KCWI (KECK), 1 night on ESI (KECK), 1 night on DEMOS (KECK), 1 night on MOSFIRE (KECK)

- **HST - Emission-line stars in the extremely metal-poor dwarf galaxy Sextans A.**
  - Cycle 31, PI: M. Gull (GO-17428; 8 orbits. Acceptance rate: 16.7% ).
- **Magellan - LLAMAS^2: ExtremeLy Low metAllicity Massive stars Atlas of Sextans A with LLAMAS -- Pilot Program**
  - 2026A, PI: M. Gull
- **Magellan - A FIRE view into OB stars and binaries in the Magellanic Bridge.**
  - 2025B, PI: M. Gull
- **Magellan - The Most Metal-Poor Massive Stars in our Neighborhood**
  - 2025B, PI: M. Gull
- **Keck - Metal-poor Massive stars, Ionizing Sources and their Surrounding Gas in the Local Group Dwarf Galaxy Leo A**
  - 2026A, 3 nights, PI: M. Gull
- **Keck\* - Characterizing Massive Contact Binary Candidates in Metal-poor Environments**
  - 2026B, 2 nights , PI: K. El-Badry (Science PI Gull)
- **Keck\* - Following up Very Massive Stars Candidates in M33 with KCWI/KCRM.**
  - 2023B, 1 night ,PI: D. Weisz (Science PI Gull)
- **Keck\* - Characterizing Extremely Metal-poor Massive Stars in Leo A.**
  - 2023A, 2 nights , PI: D. Weisz (Science PI Gull)
- **Keck\* - Characterizing Extremely Metal-poor Massive Stars in Leo A.**
  - 2022A, 2 nights ,PI: D. Weisz (Science PI Gull)
- **Keck\* - Characterizing a Stripped Star at Extremely Low Metallicity.**
  - 2022A, 1 night , PI: D. Weisz (Science PI Gull)
- **Keck\* - Characterizing Extremely Metal-poor Massive Stars in Leo A.**
  - 2020A, 2 nights , PI: D. Weisz (Science PI Gull),
- **HST - UV spectroscopy of a serendipitously-detected He star in Leo A: an unprecedented glimpse of binary mass transfer at extremely low metallicity**
  - Cycle 29, PI: Peter Senchyna ( GO-16717; 8 orbits, Co-I M.Gull)
- **JWST - Anchoring the JWST population II distance ladder to Gaia.**

- Cycle 3, PI: Alessandro Savino, (GO-04783; 24.4h, Co-I M.Gull)

\*Note: UC Berkeley PhD students cannot formally be PI of any Keck Proposal, hence why the supervisor is listed as PI on the proposal.

## AWARDS & FUNDING

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Carnegie-Caltech Brinson Fellowship Observational Astronomy	2025
Outstanding Graduate Student MPS Mentor	2025
The Shining Lights Fellow	2025
Certificate of Appreciation for MPS, University of California, Berkeley	2023, 2024, 2025
Cranor Fellowship, University of California, Berkeley (\$4000 per year)	08/2019–2025
Outstanding GSI, University of California, Berkeley	06/2022
Travel Grant, IAU (1000 Euro one time)	05/2022
Annual Scholarship, Swiss Study Foundation (20'000 CHF one time)	12/2019
30 Years - 30 Personalities Recognition, Swiss Study Foundation	03/2021
Swiss Study Foundation Scholar	08/2020–02/2026
The Barrett Prize, MIT	06/2019
The Order of the Lepton Award, MIT	06/2019
The John P. Huchra (1970) Memorial Fund Travel Award, MIT (\$1000 one time)	06/2017

## TALKS

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- Contributed Talk; KITP Conference: The Lifecycle of Stellar Black Holes "Metal-poor Massive Binaries and Binary Products in the Local Group" 11/2025
- Colloquium; ARI Institute Special Colloquium (Heidelberg), "A Panchromatic Study of Metal-poor Massive Stars in the Local Group" 10/2025
- Contributed Talk; AAS Winter Meeting "A Panchromatic Study of Metal-poor Massive Stars in the Local Group" 01/2025
- Talk; Berkeley Lunch Talk, "Metal-poor Massive Contact Binary Candidates in the Local Group" 04/2025
- Talk; CIERA Observational Astronomy Meeting "A Panchromatic Study of Metal-Poor Massive Stars in the Local Group" 11/2024
- Seminar; Carnegie Observatory Lunch Seminar "A Panchromatic Study of Metal-Poor Massive Stars in the Local Group" 09/2024
- Talk; Caltech Astronomy Tea Talk "A Panchromatic Study of Metal-Poor Massive Stars and Binaries in the Local Group" 03/2024
- Talk; Berkeley Lunch Talk, "Massive Metal-Poor Stars in Leo A" 11/2023
- Contributed Talk; 3,2,1: Massive Triples, Binaries and Mergers "A Panchromatic Study of Extremely Metal-poor Massive Stars" 07/2023
- Talk; CCA Friday Galaxy Formation Meeting "A Panchromatic Study of Massive Stars in Extremely Metal-Poor Local Group Dwarf Galaxy Leo A" 02/2023
- Seminar; MPA Seminar on Stellar Astrophysics (SESTAS) "A Panchromatic Study of Massive Stars in Extremely Metal-Poor Local Group Dwarf Galaxy Leo A" 10/2022
- Talk; Durham University Friday Lunchtime Astronomy Talk (FLAT) "A Panchromatic Study of Massive Stars in Extremely Metal-Poor Local Group Dwarf Galaxy Leo A" 10/2022
- Contributed Talk; IAU Symposium 361 Massive Stars Near and Far "A Panchromatic Study of Massive Stars in Extremely Metal-Poor Local Group Dwarf Galaxy Leo A" 05/2022
- Contributed Talk; Stars, to mark the 80th birthday of Peter Eggleton "A Panchromatic Study of Massive Stars in Extremely Metal-Poor Local Group Dwarf Galaxy Leo A" 08/2022
- Poster; Keck Science Meeting 2021 (Poster) "Optical spectroscopy of massive stars in extremely metal-poor local group dwarf galaxy Leo A" 08/2021

## COLLABORATION MEMBERSHIPS

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The Local UltraViolet and Infrared Treasury	08/2019-
The Binarity at LOw Metallicity (BLOeM) campaign collaboration	08/2025-
Sloan Digital Sky Survey	09/2025-

## TEACHING, MENTORING, OUTREACH

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I deeply care about equity in education and access to science. I contributed to the the planning and implementation of the [MPS scholars program](#) at UC Berkeley. Additionally, I have been involved in several mentoring programs and community outreach programs throughout my science career.

MPS Student Advisory Board, University of California, Berkeley	2022 –2025
Rosalind Franklin Forum for Female Scientists	2022 –2025
Undergraduate Liaison, University of California, Berkeley	2021-2022
Compass/MPS/POWER Bay Area Mentor	2020 – 2025
Astronomy Night, Volunteer	2019,2022-2024
Science Ambassador for Community Resources for Science	Fall 2021, Spring 2023
Graduate Student Instructor, University of California, Berkeley, C162/C294 Planets	Fall 2019
Graduate Student Instructor, University of California, Berkeley, 7A Intro. to Astronomy	Fall 2022
Teaching Assistant, MIT Physics Department, 8.01(L) CM I, 8.02 EM I	2017-2019

## OTHER SKILLS

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- Languages: German (Native), French (Native), English (Fluent), Spanish (Conversant)
- **[Photography](#)** (Sports, Performing Arts and Astro )