Daniel Godines

Personal Data

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Education

JUN 2021 - PRESENT — Doctor of Philosophy in Astronomy, **New Mexico State University**, NM
Advisors: Moire Prescott & Wladimir Lyra

AUG 2014 - MAY 2018 — Bachelor of Arts in Physics, **Bard College**, NY
Thesis: "A Microlensing Detection Algorithm for Wide-Field Surveys"
Advisor: Antonios Kontos

Publications

Total Citations: 39 | h-index: 3 (Source: NASA/ADS)

Peer-Reviewed Journal Articles

JAN 2026 *On the Mass Budget Problem of Protoplanetary Disks: Streaming Instability and Optically Thick Emission*
Godines, D., Lyra, W., Ricci, L., Yang, C.-C., Simon, J.B., Lim, J., Carrera, D., 2026, *ApJ*, 997, 192.

OCT 2025 *Dark classification matters: searching for primordial black holes with LSST*†
Crispim Romão, M., Croon, D., Crossey, B., **Godines, D.**, 2025, *JCAP*, 10, 066.

SEP 2025 *Anomaly detection to identify transients in LSST time series data*†
Crispim Romão, M., Croon, D., **Godines, D.**, 2025, *MNRAS*, 543, 351.

JUN 2019 *A Machine Learning Classifier for Microlensing in Wide-Field Surveys*
Godines, D., Bachelet, E., Narayan, G., Street, R. A., 2019, *A&C*, 28, 100298.

†Author list is alphabetical.

Submitted Manuscripts

MAR 2026 *A Hybrid Ensemble and Deep Learning Framework for Detecting High-Redshift Lyα Blobs in Broadband Surveys*
Godines, D., Prescott, M. K. M., submitted to *PASP*.

Research Notes

SEP 2025 *Classifying Microlensing Events from ROME/REA*
Schweitzer, A., Street, R. A., Kruszynska, K., **Godines, D.**, 2025, *RNAAS*, 9, 232.

Selected Manuscripts in Preparation

2026 *Accelerating Planet Formation Population Synthesis with Machine Learning Surrogates*
Godines, D., et al., In prep.

2026 *Automated Early Detection of Stellar and Exotic Microlensing in the Rubin Era*
Godines, D., et al., In prep.

2026 *A Machine Learning Survey of Lyα Blobs in COSMOS: Quantifying Cross-Redshift Generalization and Broadband Detection Constraints*
Godines, D., et al., In prep.

Awarded Telescope Time

2025A **Gemini North Observatory** | PI (27.7 hours, Band 3)
Automated Identification of Lyman-alpha Blobs in the Early Universe
Awarded via General Queue (GN-2025A-Q-320); Instrument: GMOS-N.

2024A **Gemini North Observatory** | PI (5.94 hours, Band 2)
Automated Identification of Lyman-alpha Blobs in the Early Universe
Awarded via Fast Turnaround (GN-2024A-FT-210); Instrument: GMOS-N.

Research Experience

2016 – 2019 **Research Intern** | Las Cumbres Observatory
Gravitational Microlensing Research with Dr. Rachel A. Street
Engineered **MicroLIA**, a machine-learning engine for real-time microlensing detection. Successfully integrated the framework into the **Rubin Observatory** alert stream and the **Fink** and **Pitt–Google** alert brokers.

Selected Open-Source Projects

- **MicroLIA** — Machine-learning algorithm for real-time transient detection. Adopted by the LSST Microlensing Science Collaboration and designed for live alert-broker deployment (e.g., FINK, ANTARES, Pitt–Google). Modular architecture supporting general time-series classification and synthetic light curve generation. Docs | Zenodo
- **pyBIA** — End-to-end pipeline for image-based classification and anomaly detection. Includes segmentation-driven cataloging, morphological feature engineering, unsupervised artifact rejection, and routines for training optimized supervised ML pipelines, including deep-learning models with automated data augmentation. Docs | Zenodo
- **protoRT** — Physics-based 3D radiative transfer framework for synthetic radio emission in planet formation simulations. Computes optical depth and emergent intensity through dust density cubes, supporting self-gravitating mono and polydisperse dust with scattering opacity and DSHARP integration. Includes a mass-excess diagnostic for quantifying observational biases from optically thick regions. Docs | Zenodo
- **rubin-lc-simulator** — Open-source framework for simulating realistic multi-band LSST light curves, accounting for official cadence strategies and photometric noise. Docs

Presentations

Contributed Talk, *Rare Gems in Big Data*, Tucson, AZ, USA 2024
"Classification of Rare Astrophysical Objects: From Galactic to Extragalactic"

Contributed Talk, *ODIN Collaboration Meeting*, Seoul, South Korea 2024
"Automated Lyα Blob Detection Using Broadband Imaging"

Poster, *50 years of Binaries and Disks: Lubow@75*, Las Vegas, NV, USA 2024
"On the Mass Budget Problem of Planet Formation Theory: Streaming Instability and Optically Thick Regions"

Scholarships and Awards

2025 - 2026 Zia Award for Excellence in Research
2021 - 2023 William Webber Voyager Graduate Fellowship
2017 - 2018 LSSTC Enabling Science Program Award
2014 - 2018 Distinguished Scientist Scholar Award

Selected Technical Skills

Programming Proficiency:	Python (Expert), C++, SQL (MySQL), MATLAB, Mathematica, HTML
Data Science & ML:	`TensorFlow`, `PyTorch`, `scikit-learn`, `XGBoost`, `pandas`, `astropy`, `rubin-sim`
Software & Tools:	`Git`, `Docker`, `Sphinx` (Documentation), `Zenodo`, DS9, Photoshop
Operating Systems:	GNU/Linux (Ubuntu/CentOS), Mac OS X
Language Proficiency:	English, Spanish (Native), French (Conversational)

Technical Training & Observational Experience

Summer 2024 **ZTF Summer School** | California Institute of Technology
Advanced training in ZTF data releases and alert-broker integration for transients.

Summer 2018 **ZTF Summer School** | California Institute of Technology
Intensive program on wide-field survey analysis and automated discovery.

Summer 2018 **Research Visit** | Space Telescope Science Institute (STScI)
Optimization of machine learning pipelines for high-dimensional astrophysical data.

Summer 2017 **CUREA Program** | Mt. Wilson Observatory
Two-week residence in observational stellar and solar physics.

Summer 2017 **Technical Workshop** | National Optical Astronomy Observatory (NOAO)
Training on LSST data infrastructure and real-time alert systems.

Summer 2016 **WIYN 3.5m Observatory** | Kitt Peak National Observatory
Observer for a joint imaging campaign supporting the *Kepler* K2 mission.

Summer 2016 **iPTF Summer School** | California Institute of Technology
Foundational training in Time-Domain Astronomy and survey operations.

Leadership & Outreach

2024–Present **Board Member** | Santa Barbara County Science & Engineering Fair
Managed logistics and STEM advocacy for grades 6–12 across Santa Barbara and San Luis Obispo counties; coordinating pathways to State finals.

June 2024 **Invited Lecture** | Santa Barbara Institute of World Culture
"Cosmic Revelations: Exploring Astronomy's Frontiers" (Public Talk).

2022 **Guest Science Columnist** | Las Cruces Sun-News
Authored features on *A.I. in Astronomy* and *The Search for Planet 9*.

2014 **Media Feature** | Santa Barbara Independent
Profiled in cover story *"A Comet in Santa Barbara's Astronomical World."*

2013–2014 **Planetary Science Tutor** | Santa Barbara City College
Youngest appointed tutor for undergraduate planetary science course.