

ALEX GAGLIANO

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💼 APPOINTMENTS

IAIFI Postdoctoral Fellow Massachusetts Institute of Technology Harvard University Center for Astrophysics NSF Institute for AI and Fundamental Interactions in Physics	Aug 2023-Present Cambridge, MA Cambridge, MA
AstroAI Senior Investigator Harvard University Center for Astrophysics	May 2025-Present Cambridge, MA
NSF-Simons SkAI Institute Affiliate Northwestern University	Jan 2024-Present Chicago, IL
Pre-Doctoral Fellow CCA Flatiron <i>Advisors:</i> Dan Foreman-Mackey, Gabriella Contardo	Jan 2022–June 2022
NSF Graduate Research Fellow University of Illinois <i>Advisor:</i> Gautham Narayan	Aug 2018 – May 2023
Post-Baccalaureate Researcher Los Alamos National Laboratory <i>Advisors:</i> Joseph Smidt, Aycin Aykutalp	Sept 2017 – Aug 2018

🎓 EDUCATION

Ph.D., Department of Astronomy University of Illinois at Urbana-Champaign <i>Advisor:</i> Gautham Narayan	Aug 2018 – April 2023 Champaign, IL
B.S., Computational Modeling & Data Analytics Virginia Polytechnic Institute & State University Physics Minor, Honors Scholar	Aug 2013 – June 2017 Blacksburg, VA

🏆 FELLOWSHIPS & AWARDS

- Needles in Rubin's Haystack Anomaly Detection Workshop Grant (\$10k) 2023
- NSF Graduate Research Fellowship (\$102k) 2020-2023
- Illinois Distinguished Fellowship (\$75k) 2018-2022
- ASA Astrostatistics Interest Group Best Paper Award, *GHOST* 2021
- DPS/AAS Education and Outreach Grant (\$1k, astro[sound]bites) 2020 & 2021
- Center for Astrophysical Surveys Fellowship (\$30k) 2019
- SC18 Supercomputing Visualization Showcase (2nd) 2018
- Academy of Integrated Science Distinguished Senior (\$1.4k) 2017
- Mathematical Contest in Modeling, Meritorious Winner (Top 7% Globally) 2017
- Wayne & Claire Horton Fellowship (\$10k) 2015
- International Space Olympics, Astrophysics Category (1st/200) 2012

🖨 COMPUTE PROPOSALS

Amazon AWS & Harvard Data Science Initiative \$10,000 awarded (PI) • <i>SpeakYSE: An Agentic LLM for Time-Domain Astrophysics</i>	2025
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ACCESS | ~12,000 GPU-hours awarded (PI)

2024

- *IAIFI Boston-Area Astrophysics and Machine Learning Hackathon*
- *An Open-Source Conversational Agent for Supernova Science*
- *Time-Domain Needles in Rubin's Haystack*

🌙 TELESCOPE PROPOSALS

LAS CAMPANAS OBSERVATORY | 13 nights awarded (PI)

2024A-2025B

- *A High-Cadence Spectroscopic Study of Transients with Magellan*
- *A Spectroscopic Study of Core-Collapse Supernovae and their Precursor Emission with Magellan*
- *Explosion Sites of Gamma-Ray Bursts and Exotic Optical Transients with the LLamas IFU*

MMT OBSERVATORY | 19 nights awarded (PI)

2024A-2025B

- *Linking Galaxy Mergers to Supernova Physics with Binospec*
- *A High-Cadence Spectroscopic Study of Transients with the MMT*

GEMINI OBSERVATORY | 68 hr awarded (PI)

2022A, 2022B, 2024B, 2025B

- *Finding the Needles in Rubin's Haystack (105 hr, LLP, CoI)*
- *Setting the Stage for r-Process Nucleosynthesis in Stripped-Envelope Supernovae*
- *Probing Pre-Explosion Mass Loss Through NIR Spectroscopy of Young SNe Ib/c*
- *The Young Supernova Experiment: Creating the Reference low-z Supernova Sample for Cosmology*

CERRO TOLOLO INTER-AMERICAN OBSERVATORY | 55 nights awarded (CoI)

2025B

- *Constructing the Gold Sample of Superluminous Supernovae and Tidal Disruption Events from LSST with SOAR*

JAMES WEBB SPACE TELESCOPE | 41 hr awarded (CoI)

GO Cycle 1

- *Nucleosynthesis, Astrophysics, and Cosmology with IR Observations of a Gravitational Wave Counterpart*
- *Detecting the Synthesis of the Heaviest Elements with Photometry of a Kilonova*
- *Nebular Spectroscopy of a Kilonova with JWST*

📖 REFEREED PUBLICATIONS

[†]Denotes equal contribution.

FIRST AUTHOR:

h=18 with 1,304 total citations and 37 refereed papers (see NASA ADS).

6. **Minuet: A Diffusion Autoencoder for Compact Semantic Compression of Multi-Band Galaxy Images.** **Gagliano, A.**, Shen, Y. & Villar, V. A., 2025. *submitted to ApJ*. [ADS](#).
5. **Evidence for an Instability-Induced Binary Merger in the Double-Peaked, Helium-Rich Type IIn Supernova 2023zkd.** **Gagliano, A.**, Villar, V. A., Matsumoto, T., Jones, D. O., Ransome, C. L., Nugent, A. E., Hiramatsu, D., Auchettl, K., Tsuna, D., Dong, Y., Gomez, S., Aleo, P. D., Angus, C., de Boer, T., Bostroem, K. A., Chambers, K. C., Coulter, D. A.; Davis, K. W., Fairlamb, J. R., Farah, J., Farias, D., Foley, R. J., Gall, C., Gao, H., Gonzalez, E. P., Howell, D. A., Huber, M. E., Kilpatrick, C. D., Lin, C.-C.; MacLeod, M. E., Magnier, E. A., McCully, C., Minguez, P., Narayan, G., Newsome, M., Patra, K. C., Rest, A., Rest, S., Smartt, S., Smith, K. W., Terreran, G., Wainscoat, R. J., Wang, Q., Yadavalli, S. K., & Zenati, Y., 2025. *ApJ*, 989(2), id.182. [ADS](#).
4. **Finding the Fuse: Prospects for the Detection and Characterization of Core-Collapse Precursor Emission with the LSST.** **Gagliano, A.**, Berger, E., Villar, V. A., Hiramatsu, D., Kessler, R., Matsumoto, T., Gilkis, A., & Laplace, E., 2024. *ApJ*, 978(1), id.110. [ADS](#).
3. **First Impressions: Early-Time Classification of Supernovae using Host Galaxy Information and Shallow Learning.** **Gagliano, A.**, Contardo, G., Foreman-Mackey, D., Malz, A. I., & Aleo, P. D, 2023 *ApJ*, 954(1). [ADS](#).
2. **An Early-Time Optical and Ultraviolet Excess in the type-Ic SN 2020oi.** **Gagliano, A.**, Izzo, L., Kilpatrick, C. D., Mockler, B., Jacobson-Galán, W. V., Terreran, G., Dimitriadis, G., Zenati, Y., Auchettl, K., Drout, M. R., Foley, R. J., Margutti, R., Rest, A., Jones, D. O., Aganze, C., Aleo, P. D., Burgasser, A.

- J., Coulter, D. A., Gerasimov, R., Gall, C., Hjorth, J., Hsu, C.-C., Magnier, E. A., Mandel, K. S., Piro, A. L., Rojas-Bravo, C., Siebert, M. R., Stacey, H., Stroh, M. C., Swift, J. J., Taggart, K., Tinyanont, S., 2022. *ApJ*, 924(2), p. 55. [ADS](#).
1. **GHOST: Using Only Host Galaxy Information to Accurately Associate and Distinguish Supernovae.** [Gagliano, A.](#), Narayan, G., Engel, A., and Kind, M.C., 2021. *ApJ*, 908(2), p. 170. [ADS](#).
- SECOND AUTHOR:**
3. **reLAISS: A Library for Flexible Similarity Searches of Supernovae and their Host Galaxies.** Reynolds, E., [Gagliano, A.](#), & Villar, V. A., 2025. *RNAAS*, 9(189). [ADS](#).
 2. **ORACLE: A Real-Time, Hierarchical, Deep-Learning Photometric Classifier for the LSST.** Shah, V., [Gagliano, A.](#), Malanchev, K., & Narayan, G., 2024. *accepted to ApJ*. [ADS](#).
 1. **The Simulated Catalogue of Optical Transients and Correlated Hosts (SCOTCH).** Lokken, M., [Gagliano, A.](#), Narayan, G., Hložek, R., Kessler, R., Crenshaw, J. F., Salo, L., Alves, C. S., Chatterjee, D., Vincenzi, M., Malz, A. I., 2023. *MNRAS*, 520(2), 2887. [ADS](#).
- NTH AUTHOR:**
36. **A Fully Photometric Approach to Type Ia Supernova Cosmology in the LSST Era: Host Galaxy Redshifts and Supernova Classification.** Mitra, A., Kessler, R., Raghunathan, S., Narayan, G., More, S., [Gagliano, A.](#), & the LSST Dark Energy Science Collaboration, 2025. *in prep*.
 35. **Optimizing Kilonova Searches: A Case Study of the Type IIb SN 2025ulz in the Localization Volume of the Low-Significance Gravitational Wave Event S250818k.** Franz, N., Subrayan, B., Kilpatrick, C. D., Hosseinzadeh, G., Sand, D. J., Alexander, K. D., Fong, W., Christy, C. T., Pearson, J., Laskar, T., Hsu, B., Rastinejad, J., Lundquist, M. J., Berger, E., Bostroem, K. A., Bom, C. R., Darc, P., Gurwell, M., Hostler Schimpf, S., Keating, G. K., Noel, P., Ransome, C., Rao, R., Santana-Silva, L., Souza Santos, A., Shrestha, M., Anche, R., Andrews, J. E., Borthakur, S., Butler, N. R., Coppejans, D. L., Daly, P. N., Daniel, K. J., Duffell, P. C., Eftekhari, T., Fields, C. E., [Gagliano, A.](#), Golay, W. W., Grichener, A., Hamden, E. T., Hiramatsu, D., Kumar, H., Manikantan, V., Margutti, R., Paschalidis, V., Paterson, K., Reichart, D. E., Renzo, M., Salmas, K., Schroeder, G., Smith, N., Spekkens, K., Strader, J., Trilling, D. E., Vieira, N., Weiner, B., & Williams, P. K. G., 2025. *accepted to ApJL*. [ADS](#)
 34. **Spectral Diversity in Type Ibn Supernovae and the Large Host Offset of SN 2024acyl.** Dong, Y., Villar, V. A., Nugent, A., Hosseinzadeh, G., Ransome, C., [Gagliano, A.](#), Tsuna, D., Gallegos-Garcia, M., Lundquist, M., Bostroem, K. A., Howell, D. A., McCully, C., Andrews, M., Farah, J., Valenti, S., Ravi, A. P., Hoang, E., Mehta, D., & Retamal, N. M., 2025. *submitted to ApJ*. [ADS](#).
 33. **AT 2024ahzi: A Type IIP Supernova Observed by the LSST Commissioning Camera.** de Soto, K., et al. (incl. [Gagliano, A.](#)), 2025. *in prep*.
 32. **When IIb Ceases To Be: Bridging the Gap Between IIb and Short-plateau Supernovae.** Farah, J., Howell, D. A., Hiramatsu, D., McCully, C., Andrews, M., Newsome, M., Gonzalez, E. P., Pellegrino, C., Berger, E., Blanchard, P., Gomez, S., Kumar, H., Bostroem, K. A., Ni, Y. Q., [Gagliano, A.](#), & Ravi, A. P., 2025. *Submitted to ApJ*. [ADS](#).
 31. **Characterizing Supernova Host Galaxies with FrankenBlast: A Scalable Tool for Transient Host Galaxy Association, Photometry, and Stellar Population Modeling.** Nugent, A., Villar, V. A., [Gagliano, A.](#), Jones, D. O., Horowicz, A., de Soto, K., Wang, B., & Margalit, B., 2025. *submitted to ApJ*. [arXiv](#).
 30. **The Type II SN 2025pht in NGC 1637: A Red Supergiant with Carbon-rich Circumstellar Dust as the First JWST Detection of a Supernova Progenitor Star.** Kilpatrick, C. D., Suresh, A., Davis, K. W., Drout, M. R., Foley, R. J., [Gagliano, A.](#), Jacobson-Galán, W. V., Kaur, R., Taggart, K., & Vazquez, J., 2025. *accepted to ApJL*. [ADS](#).
 29. **Enabling Early Transient Discovery in LSST via Difference Imaging with DECam.** Dong, Y., de Soto, K., Villar, V. A., Nugent, A., [Gagliano, A.](#), & Bostroem, K. A., 2025. *Submitted to ApJ*. [ADS](#).

28. **Characterization of type Ibn SNe.** Farias, D., Gall, C., Villar, V. A., Auchettl, K., de Soto, K. M., **Gagliano, A.**, Hoogendam, W. B., Narayan, G., Sedgewick, A., Yadavalli, S. K., Zenati, Y., Angus, C. R., David, K. W., Hjorth, J., Jacobson-Galán, W. V., Jones, D. O., Kilpatrick, C. D., Bustamante Roselli, M. J., Coulter, D. A., Dimitriadis, G., Foley, R. J., Gangopadhyay, A., Gao, H., Huber, M. E., Izzo, L., Johnson, J. L., Johnson, J. L., Piro, A. L., Rest, A., Rojas-Bravo, C., Siebert, M. R., Taggart, K., & Tinyanont, S., 2025. *submitted to A&A*. [ADS](#).
27. **SPLASH: A Rapid Host-Based Supernova Classifier for Wide-Field Time-Domain Surveys.** Boesky, A., Villar, V. A., **Gagliano, A.**, & Hsu, B., 2025. *Submitted to ApJ*. [ADS](#).
26. **A Detection of Helium in the Bright Superluminous Supernova SN 2024rmj.** Kumar, H., Berger, E., Blanchard, P. K., Gomez, S., Hiramatsu, D., **Gagliano, A.**, Andrews, M., Bostroem, K. A., Farah, J., Howell, D. A., & McCully, C., 2025. *Submitted to ApJ*. [ADS](#).
25. **Seeing the Outer Edge of the Infant Type Ia Supernova 2024epr in the Optical and Near-Infrared.** Hoogendam, W. B., Jones, D. O., Ashall, C., Shappee, B. J., Foley, R. J., Tucker, M. A., Huber, M. E., Auchettl, K., Desai, D. D., Do, A., Hinkle, J. T., Romagnoli, S., Shi, J., Syncatto, A., Angus, C. R., Chambers, K. C., Coulter, D. A., Davis, K. W., de Boer, T., **Gagliano, A.**, Kong, M., Lin, C.-C., Lowe, T. B., Magnier, E. A., Minguez, P., Pan, Y.-C., Patra, K. C., Severson, S. A., Taggart, K., Wasserman, A. R., Yadavalli, S. K., 2025. *OJA*, 8, id.120. [ADS](#).
24. **A Wide Field Map of Ultra-Compact Dwarfs in the Coma Cluster.** Pomeroy, R. T., Matrid, J. P., O'Neill, C. R., & **Gagliano, A.**, 2025. *ApJ*, 988(1). [ADS](#).
23. **An Updated Detection Pipeline for Precursor Emission in Type II Supernova 2020tlf.** Jacobson-Galán, W. V., Gonzalez, S., Patel, S., Dessart, L., Jones, D. O., Coppejans, D. L., Dimitriadis, G., Foley, R. J., Kilpatrick, C. D., Matthews, D. J., Rest, S., Terreran, G., Aleo, P. D., Auchettl, K., Blanchard, P. K., Coulter, D. A., Davis, K. W., de Boer, T. J. L., DeMarchi, L., Drout, M. R., Earl, N., **Gagliano, A.**, Gall, C., Hjorth, J., Huber, M. E., Ibik, A. L., Milisavljevic, D., Pan, Y. -C., Rest, A., Ridden-Harper, R., Rojas-Bravo, C., Siebert, M. R., Smith, K. W., Taggart, K., Tinyanont, S., Wang, Q., Zenati, Y., 2025. *RNAAS*, 9(1), id.5. [ADS](#).
22. **The Impact of Host-galaxy Properties on Supernova Classification with Hierarchical Labels.** Villar, V. A., Gomez, S., Berger, E., & **Gagliano, A.**, 2024. *ApJS*, 276(3). [ADS](#).
21. **Maven: A Multimodal Foundation Model for Supernova Science.** Zhang, G.[†], Helfer, T.[†], **Gagliano, A.**, Mishra-Sharma, S., & Villar, V. A., 2024. *Machine Learning: Science and Technology*, 5(4), id.045069. [ADS](#).
20. **The Type I superluminous supernova catalogue I: light-curve properties, models, and catalogue description.** Gomez, S., Nicholl, M., Berger, E., Blanchard, P. K., Villar, V. A., Rest, S., Hosseinzadeh, G., Aamer, A., Ajay, Y., Athukoralalage, W., Coulter, D. C. Eftekhari, T., Fiore, A., Franz, N., Fox, O., **Gagliano, A.**, Hiramatsu, D., Howell, D. A., Hsu, B., Karmen, M., Siebert, M. R., Könyves-Tóth, R., Kumar, H., McCully, C., Pellegrino, C., Pierel, J., Rest, A., & Wang, Q., 2024. *MNRAS*, 535(1), p. 471. [ADS](#).
19. **Blast: a Web Application for Characterizing the Host Galaxies of Astrophysical Transients.** Jones, D. O., McGill, P., Manning, T. A., **Gagliano, A.**, Wang, B., Coulter, D. A., Foley, R. J., Narayan, G., Villar, V. A., Braff, L., Engel, A. W., Farias, D., Lai, Z., Loertscher, K., Kutcka, J., Thorp, S., & Vazquez, J., 2024. *submitted to PASP*. [ADS](#).
18. **Find the haystacks, then look for needles: The rate of strongly lensed transients in galaxy-galaxy strong gravitational lenses.** Sainz de Murieta, A., Collett, T. E., Magee, M. R., Pierel, J. D. R., Enzi, W. J. R., Lokken, M., **Gagliano, A.**, Ryczkowski, D., 2024. *MNRAS*, 535(3). [ADS](#).
17. **Probabilistic Forward Modeling of Galaxy Catalogs with Normalizing Flows.** Crenshaw, J. F., Kalmbach, J. B., **Gagliano, A.**, Ziang, Y., Connolly, A. J., Malz, A. I., Schmidt, S. J., on behalf of The LSST Dark Energy Science Collaboration, 2024. *ApJ*, 168(2). [ADS](#).
16. **Multi-filter UV to NIR Data-driven Light Curve Templates for Stripped Envelope Supernovae.** Khakpass, S., Bianco, F. B., Modjaz, M., Fortino, W. F., **Gagliano, A.**, Larison, C. , & Pritchard, T. A, 2024. *ApJSS*, 275(2). [ADS](#).

15. **Keck Infrared Transient Survey. I. Survey Description and Data Release 1.** Tinyanont, S., Foley, R. J., Taggart, K., Davis, K. W., LeBaron, N., Andrews, J. E., Bustamante-Rosell, M. J., Camacho-Neves, Y., Chornock, R., Coulter, D. A., Galbany, L., Jha, S. W., Kilpatrick, C. D., Kwok, L. A., Larison, C., Pierel, J. R., Siebert, M. R., Aldering, G., Auchettl, K., Bloom, J. S., Dhawan, S., Filippenko, A. V., French, K. D., **Gagliano, A.**, Grayling, M., Howell, D. A., Jacobson-Galán, W. V., Jones, D. O., Le Saux, X., Macias, P., Mandel, K. S., McCully, C., Padilla Gonzalez, E., Rest, A., Rho, J., Rojas-Bravo, C., Skrutskie, M. F., Thorp, S., Wang, Q., Ward, S. M., 2024. *PASP*, 136(1). [ADS](#).
14. **Double “acct”: a distinct double-peaked supernova matching pulsational pair-instability models.** Angus, C. R., Woosley, S. E., Foley, R. J., Nicholl, M., Villar, V. A., Taggart, K., Pursiainen, M., Ramsden, P., Srivastav, S., Stevance, H. F., Moore, T., Auchettl, K., Hoogendam, W. B., Khetan, N., Yadavalli, S. K., Dimitriadis, G., **Gagliano, A.**, Siebert, M. R., Aamer, A., de Boer, T., Chambers, K. C., Clocchiatti, A., Coulter, D. A., Drout, M. R., Farias, D., Fulton, M. D., Gall, C., Gao, H., Izzo, L., Jones, D. O., Lin, C. -C., Magnier, E. A., Narayan, G., Ramirez-Ruiz, E., Ransome, C. L., Rest, A., Smartt, S. J., & Smith, K. W., 2024. *submitted to ApJL*. [ADS](#).
13. **SN 2021foa: The ‘Flip-Flop’ Type IIn/Ibn supernova.** Farias, D., Gall, C., Narayan, G., Rest, S., Villar, V. A., Angus, C. R., Auchettl, K., Davis, K. W., Foley, R., **Gagliano, A.**, Hjorth, J., Izzo, L., Kilpatrick, C. D., Perkins, H. M. L., Ramirez-Ruiz, E., Ransome, C. L., Sarangi, A., Yarza, R., Coulter, D. A., Jones, D. O., Khetan, N., Rest, A., Siebert, M. R., Swift, J. J., Taggart, K., Tinyanont, S., Wrubel, P., de Boer, T. J. L., Clever, K. E., Dhara, A., Gao, H., Lin, C. -C., 2024. *ApJ*, 977(2), id.152. [ADS](#).
12. **SN 2023ixf in Messier 101: Photo-ionization of Dense, Close-in Circumstellar Material in a Nearby Type II Supernova.** Jacobson-Galán, W. V., Dessart, L., Margutti, R., Chornock, R., Foley, R. J., Kilpatrick, C. D., Jones, D. O., Taggart, K., Angus, C. R., Bhattacharjee, S., Braff, L. A., Brethauer, D., Burgasser, A. J., Cao, F., Carlile, C. M., Chambers, K. C., Coulter, D. A., Dominguez-Ruiz, E., Dickinson, C. B., de Boer, T., **Gagliano, A.**, Gall, C., Gao, H., Gates, E. L., Gomez, S., Guolo, M., Halford, M. R. J., Hjorth, J., Huber, M. E., Johnson, M. N., Karpoor, P. R., Laskar, T., LeBaron, N., Li, Z., Lin, Y., Loch, S. D., Lynam, P. D., Magnier, E. A., Maloney, P., Matthews, D. J., McDonald, M., Miao, H. -Y., Milisavljevic, D., Pan, Y. -C., Pradyumnna, S., Ransome, C. L., Rees, J. M., Rest, A., Rojas-Bravo, C., Sandford, N. R., Ascencio, L., Sandoval, Sanjaripour, S., Savino, A., Sears, H., Sharei, N., Smartt, S. J., Softich, E. R., Theissen, C. A., Tinyanont, S., Tohfa, H., Villar, V. A., Wang, Q., Wainscoat, R. J., Westerling, A. L., Wiston, E., Wozniak, M. A., Yadavalli, S. K., Zenati, Y., 2023. *ApJL*, 954(2). [ADS](#).
11. **SN 2023ixf in Messier 101: A Variable Red Supergiant as the Progenitor Candidate to a Type II Supernova.** Kilpatrick, C. D., Foley, R. J., Jacobson-Galán, W. V., Piro, A. L., Smartt, S. J., Drout, M. R., **Gagliano, A.**, Gall, C., Hjorth, J., Jones, D. O., Mandel, K. S., Margutti, R., Ramirez-Ruiz, E., Ransome, C. L., Villar, V. A., Coulter, D. A., Gao, H., Matthews, D. J., Taggart, K., Zenati, Y., 2023. *ApJL*, 952(1). [ADS](#).
10. **Supernova 2020wnt: An Atypical Superluminous Supernova with a Hidden Central Engine.** Tinyanont, S., Woosley, S. E., Taggart, K., Foley, R. J., Yan, L., Lunnan, R., Davis, K. W., Kilpatrick, C. D., Siebert, M. R., Schulze, S., Ashall, C., Chen, T.-W., De, K., Dimitriadis, G., Dong, D. Z., Fremling, C., **Gagliano, A.**, Jha, S. W., Jones, D. O., Kasliwal, M. M., Miao, H.-Y., Pan, Y.-C., Perley, D. A., Ravi, V., Rojas-Bravo, C., Sfaradi, I., Sollerman, J., Alarcon, V., Angulo, R., Clever, K. E., Crawford, P., Couch, C., Dandu, S., Dhara, A., Johnson, J., Lai, Z., & Smith, C., 2023. *ApJ*, 951(1). [ADS](#).
9. **The Young Supernova Experiment Data Release 1 (YSE DR1): Light Curves and Photometric Classification of 1975 Supernovae.** Aleo, P. D., Malanchev, K., Sharief, S., Jones, D. O., Narayan, G., Foley, R. J., Villar, V. A., Angus, C. R., Baldassare, V. F., Bustamante-Rosell, M. J., Chatterjee, D., Cold, C., Coulter, D. A., Davis, K. W., Dhawan, S., Drout, M. R., Engel, A., French, K. D., **Gagliano, A.**, Gall, C., Hjorth, J., Huber, M. E., Jacobson-Galán, W. V., Kilpatrick, C. D., Langeroodi, D., Macias, P., Mandel, K. S., Margutti, R., Matasic, F., McGill, P., Pierel, J. D. R., Ramirez-Ruiz, E., Ransome, C. L., Rojas-Bravo, C., Siebert, M. R., Smith, K. W., de Soto, K. M., Stroh, M. C., Tinyanont, S., Taggart, K., Ward, S. M., Wojtak, R., Auchettl, K., Blanchard, P. K., de Boer, T. J. L., Boyd, B. M., Carroll, C. M., Chambers, K. C., DeMarchi, L., Dimitriadis, G., Dodd, S. A., Earl, N., Farias, D., Gao, H., Gomez, S., Grayling, M., Grillo, C., Hayes, E. E., Hung, T., Izzo, L., Khetan, N., Kolborg, A. N., Law-Smith, J. A. P., LeBaron, N., Lin, C. -C., Luo, Y., Magnier, E. A., Matthews, D., Mockler, B., O'Grady, A. J. G., Pan, Y. -C., Politisch, C. A., Raimundo, S. I., Rest, A., Ridden-Harper, R., Sarangi, A., Schrøder, S. L., Smartt, S. J., Terreran, G., Thorp, S., Vazquez, J., Wainscoat, R. J., Wang, Q., Wasserman, A. R., Yadavalli, S. K., Yarza, R., Zenati, Y., Young Supernova Experiment, 2023. *ApJSS*, 266(1). [ADS](#).

8. **Relative Intrinsic Scatter in Hierarchical Type Ia Supernova Sibling Analyses: Application to SNe 2021hpr, 1997bq, and 2008fv in NGC 3147.** Ward, Sam M., Thorp, S., Mandel, K. S., Dhawan, S., Jones, D. O., Taggart, K., Foley, R. J., Narayan, G., Chambers, K. C., Coulter, D. A., Davis, K. W., de Boer, T., de Soto, K., Earl, N., **Gagliano, A.**, Gao, H., Hjorth, J., Huber, M. E., Izzo, L., Langeroodi, D., Magnier, E. A., McGill, P., Rest, A., Rojas-Bravo, C., Wojtak, R., for the Young Supernova Experiment, 2023. *ApJ*, 956(2). [ADS](#).
7. **Evidence for Extended Hydrogen-Poor CSM in the Three-Peaked Light Curve of Stripped Envelope Ib Supernova.** Zenati, Y., Wang, Q., Bobrick, A., DeMarchi, L., Glanz, H., Rozner, M., Rest, A., Metzger, B. D., Margutti, R., Gomez, S., Smith, N., Toonen, S., Bright, J. S., Norman, C., Foley, R. J., **Gagliano, A.**, Krolik, J. H., Smartt, S. J., Villar, V. A., Narayan, G., Fox, O., Auchettl, K., Brethauer, D., Clocchiatti, A., Coelln, S. V., Coppejans, D. L., Dimitriadis, G., Doroszmai, A., Drout, M., Jacobson-Galan, W., Gao, B., Ridden-Harper, R., Kilpatrick, C. D., Laskar, T., Matthews, D., Rest, S., Smith, K. W., McKenzie Stauffer, C., Stroh, M. C., Strolger, L.-G., Terreran, G., Pierel, J. D. R., Piro, A. L., 2022. *submitted to ApJ*. [ADS](#).
6. **DELIGHT: Deep Learning Identification of Galaxy Hosts of Transients Using multi-resolution images.** Förster, F., Muñoz Arancibia, A. M., Reyes-Jainaga, I., **Gagliano, A.**, Britt, D., Cuellar-Carrillo, S., Figueroa-Tapia, F., Polzin, A., Yousef, Y., Arredondo, J., Rodríguez-Mancini, D., Correa-Orellana, J., Bayo, Amelia, B., Franz E., C., Márcio, C.-V., Guillermo, Dastidar, R., Estévez, P. A., Pignata, G., Hernández-García, L., Huijse, P., Reyes, E., Sánchez-Sáez, P., Ramírez, M., Grandón, D., Pineda-García, J., Chabour-Barra, F., & Silva-Farfán, J., 2022. *AJ*, 164(5). [ADS](#).
5. **AT 2020neh: A fast rising tidal disruption event from an intermediate mass black hole.** Angus, C. R., Baldassare, V. F., Mockler, B., Foley, R. J., Ramirez-Ruiz, E., Raimundo, S. I., French, K. D., Auchettl, K., Pfister, H., Gall, C., Hjorth, J., Drout, M. R., Alexander, K. D., Dimitriadis, G., Hung, T., Jones, D. O., Rest, A., Siebert, M. R., Taggart, K., Terreran, G., Tinyanont, S., Carroll, C. M., DeMarchi, L., Earl, N., **Gagliano, A.**, Izzo, L., Villar, V. A., Zenati, Y., Arendse, N., Cold, C., de Boer, T. J. L., Chambers, K. C., Coulter, D. A., Khetan, N., Lin, C. C., Magnier, E. A., Rojas-Bravo, C., Wainscoat, R. J., & Wojtak, R., 2022. *NatAs*, 6, p. 1452. [ADS](#).
4. **Final Moments I: Precursor Emission, Envelope Inflation, and Enhanced Mass loss Preceding the Luminous Type II Supernova 2020tlf.** Jacobson-Galán, W. V., Dessart, L., Jones, D. O., Margutti, R., Coppejans, D. L., Dimitriadis, G., Foley, R. J., Kilpatrick, C. D., Matthews, D. J., Rest, S., Terreran, G., Aleo, P. D., Auchettl, K., Blanchard, P. K., Coulter, D. A., Davis, K. W., de Boer, T. J. L., DeMarchi, L., Drout, M. R., Earl, N., **Gagliano, A.**, Gall, C., Hjorth, J., Huber, M. E., Ibik, A. L., Milisavljevic, D., Pan, Y. -C., Rest, A., Ridden-Harper, R., Rojas-Bravo, C., Siebert, M. R., Smith, K. W., Taggart, K., Tinyanont, S., Wang, Q., Zenati, Y., 2021. *ApJ*, 924(1), p. 15. [ADS](#).
3. **Progenitor and Close-In Circumstellar Medium of Type II Supernova 2020fqv from High-Cadence Photometry and Ultra-Rapid UV Spectroscopy.** Tinyanont, S., Ridden-Harper, R., Foley, R. J., Morozova, V., Kilpatrick, C. D., Dimitriadis, G., DeMarchi, L., **Gagliano, A.**, Jacobson-Galán, W. V., Messick, A., Pierel, J. D. R., Piro, A. L., Ramirez-Ruiz, E., Siebert, M. R., Chambers, K. C., Clever, K. E., Coulter, D. A., De, K., Hankins, M., Hung, T., Jha, S. W., Jimenez Angel, C. E., Jones, D. O., Kasliwal, M. M., Lin, C. -C., Marques-Chaves, R., Margutti, R., Moore, A., Pérez-Fournon, I., Poidevin, F., Rest, A., Shirley, R., Smith, C. S., Strasburger, E., Swift, J. J., Wainscoat, R. J., Wang, Q., & Zenati, Y., 2021. *MNRAS*, 512(2). [ADS](#).
2. **The Young Supernova Experiment: Survey Goals, Overview, and Operations.** Jones, D. O., Foley, R. J., Narayan, G., Hjorth, J., Huber, M. E., Aleo, P. D., Alexander, K. D., Angus, C. R., Auchettl, K., Baldassare, V. F., Bruun, S. H., Chambers, K. C., Chatterjee, D., Coppejans, D. L., Coulter, D. A., DeMarchi, L., Dimitriadis, G., Drout, M. R., Engel, A., French, K. D., **Gagliano, A.**, Gall, C., Hung, T., Izzo, L., Jacobson-Galán, W. V., Kilpatrick, C. D., Korhonen, H., Margutti, R., Raimundo, S. I., Ramirez-Ruiz, E., Rest, A., Rojas-Bravo, C., Siebert, M. R., Smartt, S. J., Smith, K. W., Terreran, G., Wang, Q., Wojtak, R., Agnello, A., Ansari, Z., Arendse, N., Baldeschi, A., Blanchard, P. K., Brethauer, D., Bright, J. S., Brown, J. S., de Boer, T. J. L., Dodd, S. A., Fairlamb, J. R., Grillo, C., Hajela, A., Hede, C., Kolborg, A. N., Law-Smith, J. A. P., Lin, C. -C., Magnier, E. A., Malanchev, K., Matthews, D., Mockler, B., Muthukrishna, D., Pan, Y. -C., Pfister, H., Ramanah, D. K., Rest, S., Sarangi, A., Schröder, S. L., Stauffer, C., Stroh, M. C., Taggart, K. L., Tinyanont, S., & Wainscoat, R. J., for the Young Supernova Experiment, 2021. *ApJ*, 908(2), p. 143. [ADS](#).

1. A Wide-field Map of Intracluster Globular Clusters in Coma. Madrid, J.P., O'Neill, C.R., **Gagliano, A.**, and Marvil, J.R., 2018. *ApJ*, 867(2), p. 144. [ADS](#).

WORKSHOP & CONFERENCE PROCEEDINGS

9. Diffusion Autoencoders with Perceivers for Long, Irregular and Multimodal Sequences. Shen, Y., & **Gagliano, A.**, 2025. *Machine Learning for the Physical Sciences Workshop, ICLR; and ICLR main conference*. [ADS](#).
8. Hierarchical Simulation-Based Inference of Supernova Power Sources and their Physical Properties. Vidal, E., **Gagliano, A.**, & Cuesta-Lazaro, C., 2025. *Machine Learning for the Physical Sciences Workshop, ICML*. [ADS](#).
7. Mixture-of-Expert Variational Autoencoders for Cross-Modality Embedding of Type Ia Supernova Data. Shen, Y.[†], & **Gagliano, A.[†]**, 2025. *Machine Learning for Astrophysics Workshop (spotlight oral)*, ICML co-located workshop. [ADS](#).
6. Variational diffusion transformers for conditional sampling of supernovae spectra. Shen, Y., & **Gagliano, A.**, 2025. *Frontiers in Probabilistic Inference & Advances of Approximate Bayesian Inference Workshops, ICLR*. [ADS](#).
5. Maven: A Multimodal Foundation Model for Supernova Science. Zhang, G.[†], Helfer, T.[†], **Gagliano, A.**, Mishra-Sharma, S., & Villar, V., A., 2024. *Foundation Models for Science, Time Series in the Age of Large Models (spotlight oral)*, and Self-Supervised Learning Workshops, NeurIPS. [ADS](#).
4. Hierarchical Cross-entropy Loss for Classification of Astrophysical Transients. Villar, V. A., de Soto, K., & **Gagliano, A.**, 2023. *Machine Learning for the Physical Sciences Workshop, NeurIPS*. [ADS](#).
3. A Physics-Informed Variational Autoencoder for Rapid Galaxy Inference and Anomaly Detection. **Gagliano, A.** & Villar, V. A., 2023. *Machine Learning for the Physical Sciences, NeurIPS*. [ADS](#).
2. From Data to Software to Science with the Rubin Observatory LSST. Breivik, Katelyn, Connolly, Andrew J., Ford, K. E. Saavik, Jurić, Mario, Mandelbaum, Rachel, Miller, Adam A., Norman, Dara, Olsen, Knut, O'Mullane, William, Price-Whelan, Adrian, Sacco, Timothy, Sokoloski, J. L., Villar, Ashley, Acquaviva, Viviana, Ahumada, Tomas, AlSayyad, Yusra, Alves, Catarina S., Andreoni, Igor, Anguita, Timo, Best, Henry J., Bianco, Federica B., Bonito, Rosaria, Bradshaw, Andrew, Burke, Colin J., Rodrigues de Campos, Andresa, Cantiello, Matteo, Caplar, Neven, Chandler, Colin Orion, Chan, James, Nicolaci da Costa, Luiz, Danieli, Shany, Davenport, James R. A., Fabbian, Giulio, Fagin, Joshua, **Gagliano, Alexander**, Gall, Christa, Garavito Camargo, Nicolás, Gawiser, Eric, Gezari, Suvi, Gomboc, Andreja, Gonzalez-Morales, Alma X., Graham, Matthew J., Gschwend, Julia, Guy, Leanne P., Holman, Matthew J., Hsieh, Henry H., Hundertmark, Markus, Ilić, Dragana, Ishida, Emille E. O., Jurkić, Tomislav, Kannawadi, Arun, Kosakowski, Alekzander, Kovačević, Andjelka B., Kubica, Jeremy, Lanusse, François, Lazar, Ilin, Levine, W. Garrett, Li, Xiaolong, Lu, Jing, Luna, Gerardo Juan Manuel, Mahabal, Ashish A., Malz, Alex I., Mao, Yao-Yuan, Medan, Ilija, Moeyens, Joachim, Nikolić, Mladen, Nikutta, Robert, O'Dowd, Matt, Olsen, Charlotte, Pearson, Sarah, Villicana Pedraza, Ilhuiyolitzin, Popinchalk, Mark, Popović, Luka C., Pritchard, Tyler A., Quint, Bruno C., Radović, Viktor, Ragosta, Fabio, Riccio, Gabriele, Riley, Alexander H., Rožek, Agata, Sánchez-Sáez, Paula, Sarro, Luis M., Saunders, Clare, Savić, Đorđe V., Schmidt, Samuel, Scott, Adam, Shirley, Raphael, Smotherman, Hayden R., Stetzler, Steven, Storey-Fisher, Kate, Street, Rachel A., Trilling, David E., Tsapras, Yiannis, Ustamujic, Sabina, van Velzen, Sjoert, Vázquez-Mata, José Antonio, Venuti, Laura, Wyatt, Samuel, Yu, Weixiang, & Zabludoff, Ann, 2022. *White paper*; arXiv:2208.02781. [ADS](#).
1. Astro[sound]bites: a New Audio Resource for Conveying Recent Astronomy Research. **Gagliano, A.**, Rice, M. & Saunders, W.R., 2021. *ASP2020: Embracing the Future*, p. 111. [ADS](#).

SEMINARS & COLLOQUIA

MIT FutureTech

Nov 2025

Sys2025: Systematic and Measurement Errors Across the Sciences

Nov 2025

Instituto de Física Teórica Madrid Colloquium

Nov 2025

IDEaS Institute AI for Science Tutorial	Oct 2025
Rutgers University Transient Soirée	July 2025
Harvard CfA Machine Learning in Astrophysics Lecture	April 2024
IAIFI Colloquium	March 2024
University of Michigan Astronomy Colloquium	Nov 2023
Five Colleges Astronomy Colloquium	Oct 2023
LSST Transient and Variable Science Colloquium	Aug 2023
Caltech Time-Domain Astronomy Center	Sept 2022
UC Berkeley Astronomy Department	Sept 2022
Lancaster University Seminar	May 2022
Dark Energy Science Collab. Time Domain Working Group	Feb 2022
Tri-State Cosmology x Data Science	Jan 2022
Dark Energy Science Collab. Analysis Seminar	Sept 2021
UIUC ASTR596: AI in Astronomy Lecture	Sept 2021
DiRAC Seminar, University of Washington	June 2021
LSST Transient and Variable Science Plenary	June 2021
DESC Photo-z Working Group	April 2021
National Center for Supercomputing Applications	March 2020

ACADEMIC SERVICE

NASA Cosmic Origin Program AI Interest Group Leadership Council	Ongoing
ICML ML4Astro 2025 (Co-Located) SOC Lead	March 2025 - July 2025
IAIFI Summer School and Workshop Tutorial Lead, Organizer	Aug 2023, 2024
Reviewer for NOIRLab Observatories	Ongoing
National Science Foundation Grant Panelist	Fall 2024
MIT Leadership and Professional Strategies Program (8.396/8.397) Co-Facilitator	Spring 2024
Time-Domain Needles in Rubin's Haystack Hackathon Organizer	April 2024
IAIFI Speaker Selection Committee Member	Ongoing
IAIFI Community-Building Committee Member	Jan-June 2024
LSST/DESC Virtual Meeting Science Organizing Committee	Feb 2024
Boston Astrophysics x ML Hackathon Local Organizing Committee	Jan 2024
LSST ISSC Executive Council Co-Lead	2024-2025
LSST ISSC Membership Committee Executive Council Liaison	Ongoing
LSST DESC Machine Learning (MaLTS) Topical Team Co-Lead	Ongoing
Reviewer for ICML, NeurIPS Workshops; RASTI, JOSS, MNRAS, PRD & AAS Journals	Ongoing
LSST BOOM 2022 Local Organizing Committee	July 2022
UIUC Astronomy Graduate Admissions PhD Representative	Oct 2021–March 2022
• Scored ~100 applications and selected students for admission	
DESC Sprint Week Local Organizing Committee	Sept 2021–Oct 2021
• Designed hack schedule and coordinating logistics for ~100 attendees in team of 16	
IAU Junior Member Working Group Associate Member	July 2021–Aug 2021
• Drafted official UNESCO position paper on youth engagement on behalf of 400 NGOs	
VT Wayne & Claire Horton Fellowship Selection Committee Member	March 2020
VT Honors Odyssey Fellowships Selection Committee Member	March 2018

CONFERENCE TALKS

INVITED:

Caltech Hotwiring the Transient Universe	March 2026
EuCAiF Foundation Models for Multi-Messenger Astronomy	Dec 2025
IAIFI Summer Workshop (talk & panel)	Aug 2025
Boombox Science Meeting	June 2025
American Astronomical Society Meeting #246 (talk & panel)	June 2025
Bites of Foundation Models for Science Workshop	June 2025

Foundation Models for Astronomy, Flatiron Institute	May 2025
Superluminous (talk & panel)	May 2025
The Revolutionary Impact of Generative AI, Harvard/MIT	Jan 2024
ASA Joint Statistical Meeting 2021	Aug 2021
LSSTC Enabling Science Broker Workshop II	Apr 2021
LSST DESC Plenary	Feb 2021

CONTRIBUTED:

SMASH AI4Science Slovenia	Sept 2025
AI-STAR Workshop at the MIT Kavli Institute	Nov 2024
Machine Learning for Transient Science, University of Warwick	Dec 2023
Cosmic Streams in the Era of Rubin	Dec 2023
Rubin Project and Community Workshop	Aug 2023
Transient and Variable Universe	June 2023
Rubin Observatory LSST @ Europe4	Oct 2022
BOOM! An LSSTC Workshop	July 2022
Exploring the Transient Universe with the Nancy Grace Roman Space Telescope	Feb 2022
Research Byte, LSST DESC February Meeting	Feb 2022
Caltech Astroinformatics 2021	Nov 2021
Rubin Project and Community Workshop	Aug 2021
Illinois Astrofest #2	May 2021
Rubin Project and Community Workshop	Aug 2020
European Astronomical Society 2020	July 2020
LSST DESC Meeting	Jan 2020
Illinois Astrofest #1	Apr 2019
American Astronomical Society Meeting #233	Jan 2019

 **TEACHING & MENTORING****GRADUATE STUDENTS**

Mark Mazumder (Harvard)	2025-Present
• Constructing an LLM benchmark for supernova science	
Edgar Vidal (Tufts)	2025-Present
• Using flow-matching and SBI to infer supernova explosion properties from light curves	
Ved Shah (Northwestern)	2024-Present
• Designing a hierarchical classifier/anomaly detection engine for Vera Rubin Obs.	
Yunyi Shen (MIT)	2024-Present
• Exploring strategies for multi-modal embedding of time-domain datasets	
Anna Tartaglia (Harvard)	2025-Present
• Building a neural network to predict the ages of astronomical transients	
Emmanuel Garcia Berrios (UIUC), Sloan Peer Mentor	2021–2022
• Provided weekly guidance on research and career options in STEM	
• Currently Lead Data Scientist at Nagnoi	

UNDERGRADUATE STUDENTS

Joaquin de Castro (Harvard)	2025-Present
• Training an SN Ibn classifier with 2D gaussian process regression	
David Cao (Harvard)	2025
• Pixel-level inference of galaxy properties with convolutional network	
Wendy Sun (MIT)	2025
• Training a mixture-of-experts, multi-modal supernova classifier	
Jesus Caraballo Anaya (MIT)	2025-Present
• Re-designing the DASH spectroscopic classifier	

Samuel Gebresenbet (MIT)	2025
• Characterizing the diversity of nuclear transients with GPs	
Joost van Asperen (Harvard), Junior Thesis Advisor	Fall 2023
• Automated identification of spiral arms in supernova host galaxies and compared offsets by class	
Zimo Qu (UIUC), Graduate Mentor	2021–2022
• Provided guidance in undergraduate coursework, research	
• Currently undergraduate at UC Berkeley	
Kunal Bhatia (UIUC), Graduate Mentor	2019–2021
• Held bi-weekly meetings to advise on graduate applications; now a Master's Student at Heidelberg	
Rubin Observatory Summer Data Summit Guest Lecturer	July 2023
UIUC Graduate College Mentoring Certification	Jan 2022
GC 500: Graduate Mentor Practicum	Jan 2022 – May 2022
Undergraduate Research Apprenticeship Program Mentor	Aug 2021–May 2022
La Serena School for Data Science Teaching Assistant	Aug 2021

INTERNAL TALKS

INVITED:

Harvard Center for Astrophysics AstroAI Lunch Talk	Nov 2025
Harvard CfA ITC Luncheon	March 2024
University of California, Santa Cruz FLASH Talk	Sept 2022
Center for Computational Astrophysics Machine Learning Journal Club	July 2022
MIT Brown Bag Lunch	May 2022
Caltech Tea	March 2022
Princeton Thunch	Feb 2022
Yale Galaxy Lunch	March 2021

SELECTED OUTREACH

Career Panel, US AI Olympiad	April 2025
Guest Lecture, Astronomy on Tap Boston	Oct 2023
Astro[Sound]Bites Founder and Co-Host	Nov 2019–July 2023
• Founded bi-weekly astronomy podcast; >20k downloads, 200 listeners in >70 countries	
Astronomical Society of the Pacific Design Tester	March 2019 – May 2020
• Evaluated strategies for improving audience engagement in STEM events	
Education Justice Project Workshop Coordinator	Jan 2019 – Jan 2020
• Designed data science workshops at Danville Correctional Center for 30 incarcerated students	
Universe Awareness Astronomy Ambassador	Jan 2017 – Jun 2018
• Coordinated stargazing events in Los Alamos among local high school students	
The Story Of Foundation Exhibit Researcher	Dec 2016 – Dec 2017
• Spearheaded sound-based astronomy exhibit in Goa, India using Python, Arduino; viewed by >2k students	
Computational Modeling Club Vice President	Aug 2016 – May 2017
• Coordinated 3-day hackathon of 100 students	
IAU Office of Astronomy for Development Intern	Aug 2016 – Sept 2016
• Led secondary school science activities for Science Week with SAAO, reaching >1.2k students	

REFLECTIONS

- **Gautham Narayan** | University of Illinois, Urbana-Champaign/SkAI
- **V. Ashley Villar** | Harvard University
- **Edo Berger** | Harvard University
- **Ryan Foley** | University of California, Santa Cruz
- **Dan Foreman-Mackey** | Google Deepmind
- **Renée Hložek** | University of Toronto/Dunlap Institute
- **Josh Speagle** | University of Toronto/Dunlap Institute

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MEDIA COVERAGE

- Why the death of this star is very, very strange. Patel, K., 2025, *The Washington Post*.
- A Peculiar Supernova Prompts New Theories About the Cosmos. Santucci, J., 2025, *USA Today*.
- New type of supernova detected as black hole causes star to explode. Dunham, W., 2025, *Reuters*.
- AI Helps Astronomers Discover New Type of Supernova. Edmonds, P., 2025, *Harvard CfA*.
- Catching Core-Collapse Supernovae Before They Happen. Gault, L., 2025, *AAS Nova*.