

Alex I. Malz

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Professional Experience

McWilliams Cen. for Cosmology Postdoc (Special Faculty), Carnegie Mellon University (CMU)

Project Scientist, LSST Interdisciplinary Network for Collaborative Computing (LINCC) Frameworks 2022–

Visiting Scientist, Lawrence Livermore National Laboratory (LLNL) 2021–

Postdoctoral Research Fellow, German Centre for Cosmological Lensing (GCCL) 2019–22

Education & Academic Awards

PhD 2020, Physics, New York University (NYU) Graduate School of Arts and Sciences (GSAS)

Thesis: Probabilistic analysis methods for cosmology using uncertainty-dominated photometric data

Advisor: David Hogg DOI: [dx.doi.org/10.5281/zenodo.3973536](https://doi.org/10.5281/zenodo.3973536)Finalist, [Dance Your Ph.D. Contest](#), 2019

GSAS Ted Keusseff Fellow 2018-19; GSAS MacCracken Fellow 2014-18

Department of Energy Office of Science Graduate Student Research SCGSR Fellow 2017

MS 2014, Astronomy & Astrophysics, Pennsylvania State University (PSU)

Astronomy & Astrophysics Braddock/Roberts Fellow 2012-13

BS 2011, Physics & History, California Institute of Technology (Caltech)

Caltech President's Scholar 2006-11

Leadership & Scientific Collaborations

Roman High Latitude Imaging Survey Project Infrastructure Team, 2023–

Cosmological Advanced Survey Telescope for Optical and ultraviolet Research (CASTOR), 2022–

Vera Rubin Observatory Legacy Survey of Space and Time (LSST) Science Collaborations (SCs)

Dark Energy SC (DESC) Builder 2020–, Full Member 2016–, Member 2016–;

DESC Photometric Redshifts Working Group Convener 2019-21;

DESC Redshift Assessment Infrastructure Layers (RAIL) Topical Team Lead 2021-24;

DESC Publication Board 2023–; Collab. Council 2018-20; Membership Committee 2017-19

Informatics & Statistics SC (ISSC) Member 2019–; Exec. Council 2023–; Pub. Comm. 2024–

Galaxies, Transients & Variable Stars, Active Galactic Nuclei SCs Member 2022–

Strong Lensing, Solar System SCs Member 2024–

Cosmostatistics Initiative (COIN) Member 2018–

Grants

Co-I, LSST-DA EDI Grant 2024, DESC Sprint School

PI, DESC workshop 2023, RAIL Topical Team Sprint Week

PI, CMU McWilliams/PSC Seed Grant 2022-3 for “Impossible Problems” seminar series

PI, LSST Corporation (LSSTC) Enabling Science 2022 for ISSC Ambassador student travel

LSSTC Enabling Science 2021

Organizer, ISSC Ambassadors 6 of 8 applications for interdisciplinary student research funded

PI, Stress-testing multimodal photometric redshift posteriors in the extrapolative regime

PI, LSSTC Enabling Science 2019, DESC Cluster Lensing Mass Modeling Sprint Week

Co-I, LSSTC Enabling Science 2018, DESC Cluster Lensing Mass Modeling Sprint Week

Co-I, NSF 2015, AST-1517237: New Probabilistic Methods for Observational Cosmology

Contributed Talks, Workshops & Hackathon Participation

21 contributed presentations at 25 conferences and workshops since 2016

3-time Astro Hack Week participant, 2-time COIN Resid. Prog. participant; +3 misc. hackathons

Invited Talks

2024

RUB, Astronomy Colloquium
University of Washington, Astronomy Department Colloquium
Northwestern U., Cent. for Interdisc. Exploration and Res. in Astrophys. (CIERA) Theory
Mass. Inst. of Tech., Inst. for Artificial Intelligence and Fundamental Interactions (IAIFI)

2023

University of Delaware, Physics Seminar
University of Delaware, Electrical and Computer Engineering Colloquium
CMU-University of Pittsburgh, AstroLunch seminar
CMU, 3rd Nobel Turing Challenge Initiative Workshop
Northeastern University, Physics Colloquium
CMU, Statistical Methods for Physical Sciences (STAMPS) Colloquium
KITP-CCA, Building a Phys. Understanding of Galaxy Evol. with Data-driven Astro. Tutorial

2022

CMU, Impossible Problems Interdisciplinary Wine-and-Cheese Seminar
Pan-Survey SED Forum, Photometric Redshifts
Stony Brook University, Astronomy Group Colloquium
Lawrence Livermore National Laboratory, Lab-wide Seminar

2021

Ludwig-Maximilians-Universität Munich, Origins Cluster Data Science Laboratory Seminar
American Astronomical Society (AAS) #238 Meeting-in-a-Meeting, Machine Learning in Astro.
Dark Energy Spectroscopic Instrument (DESI) Collaboration, Machine Learning Seminar
Princeton University, Institute for Advanced Study Cosmology Lunch Talk
Machine Learning Club, Debate Panel: Will ML Solve Photometric Redshifts?

2019

Berkeley Cen. for Cosm. Phys., Accurate Lensing in the Era of Precision Cosmo. Workshop
Royal Observatory Edinburgh, Institute for Astronomy Seminar
University of Washington, Data Intensive Research in Astronomy and Cosmology Seminar

2018

Lawrence Livermore National Laboratory, Cosmology Seminar
Lawrence Berkeley National Laboratory, Berkeley Center for Cosmological Physics Seminar
Leiden University, Astronomy Seminar
University of Leiden Lorentz Center, Colours of the Universe Workshop
Carnegie Mellon University, ML + Time Domain Workshop
Laboratoire de Physique Corpusculaire de Clermont, Seminar
Laboratoire de Physique Subatomique et de Cosmologie de Grenoble, Colloquium

2017

State University of New York at Stony Brook, Astronomy Colloquium
University of Toronto, Canadian Institute for Theoretical Astrophysics Seminar
Stanford University, Kavli Institute for Particle Astrophysics and Cosmology Tea
Tohoku University, Photo-z Workshop for Large Surveys

2016

University College London, Astronomy Seminar
Imperial College London, Astronomy Seminar
University of Pittsburgh, Photometric Redshifts for LSST Workshop

Professional Service

SOC member, Time Domain Needles in Rubin's Haystack Hackathon Harvard CfA, Spring 2024
 SOC member, ISSC Collaboration Meeting Harvard CfA, Spring 2024
 CMU Outreach Committee member 2023-
 Session Facilitator, Rubin Project & Community Workshop Summers 2020, -21, -22, -23, -24
 Hackathon Leader, From Quarks to Cosmos with AI CMU, Summer 2021
 Tutorial Co-organizer, Bayesian Deep Learning for Cosmology and Gravitational Waves
 Astroparticle and Cosmology Laboratory (APC) Université de Paris, Winter 2020
 Tutorial Organizer, DESC Sprint Week Texas A&M University, Fall 2019
 SOC+LOC member, Photometric LSST Astronomical Time-Series Classification Challenge
 (PLAsTiCC) NYU, Spring 2018
 Hackathon Leader, Astro Hack Week UC Berkeley, Fall 2017
 LOC member, Astro Hack Week NYU, Fall 2015
 Reviewer, NSF Astronomy and Astrophysics Research Grants (AAG) dates redacted for confidentiality
 Referee, MNRAS, ApJ, A&A, Astronomy and Computing dates redacted for confidentiality

Research Supervision & Mentoring

2024-: Jenny Dong & Andrew Yuan; CMU Stats & Data Science, BS 2027
 2024-: Rachel Ouyang; CMU Physics→UChicago Physics, BS 2027
 2023-: Alice Crafford; CMU Physics, BS 2025
 2021-22: Natalia Stylianou; U. of Leicester, BS & MS 2022; Oxford U., PhD. 2025
 2021-22: Nicola Hunfeld; RUB Astronomy, MS 2022
 2018: David Mykityn, Dave Perrett, Ted Singer & Zora Tung; non-academic professionals
 2018: Marin Hyatt & Lia Lubit; Hunter College High School 2020

Teaching

Invited Teacher

Building a Phys. Understanding of Galaxy Evol. with Data-driven Astro. KITP-CCA, Winter 2023
 LSSTC Data Science Fellowship Program (Northwestern U., Fall 2022)
 LSST-DESC Dark Energy School (U. of Arizona, Winter 2020)

Instructor on Record

PSU ASTRO 011 Elementary Astronomy Laboratory (Spring 2013)

Teaching Assistant

NYU PHYS-UA 7 The Universe: Its Nature and History (Spring 2018)
 NYU PHYS-UA 15 Introduction to Cosmology (Fall 2017)
 PSU ASTRO 120 The Big Bang Universe (Spring 2014)
 PSU ASTRO 292 Astronomy of the Distant Universe (Springs 2013, 2014)
 PSU ASTRO 291 Astronomical Methods and the Solar System (Falls 2012, 2013)
 PSU ASTRO 001 Astronomical Universe (Falls 2012, 2013)

Guest Lecturer

PSU ASTRO 485 Introduction to High-Energy Astronomy (Fall 2013)
 PSU ASTRO 291 Astronomical Methods and the Solar System (Fall 2012)
 PSU ASTRO 001 Astronomical Universe (Fall 2012)

Public Outreach

STEM@CMU Panelist, Chief Science Officer Leadership training program Fall 2023

CMU Outreach Committee member 2023-24

Judge, New York City Science and Engineering Fair finals event Springs 2018, -21, -22

Juror, German Young Physicists' Tournament North Rhine-Westphalia Winter 2021

Contestant, Dance Your Ph.D. tinyurl.com/aimalz-dance-your-phd Winter 2018-19

Produced, directed, choreographed, and danced an entertaining explanation of Malz & Hogg (2021)

Math Circle Speaker at Bridge to Enter Advanced Mathematics beammath.org Summer 2018

Designed and taught applied geometry lessons in the context of astronomy

Judge, New York City Science and Engineering Fair finals event Spring 2018, 2021

Guest Speaker, Hunter College High School Science Club Spring 2016

Judge, Pennsylvania Junior Academy of Science finals event Spring 2013

Outreach Developer & Facilitator, PSU AstroFest Summers 2012, -13, -14

Created and implemented tie-dye-based activities teaching astronomy concepts tinyurl.com/astro-tie-dye

Publications

AIM has been awarded Builder Status within the LSST-DESC, which grants authorship rights on all DESC publications enabled by his work on photometric redshifts, time-domain classification, and service to the collaboration; however, he has chosen to only co-author papers to which he made *a direct, scientific contribution*.

32. B. Scott, **A.I. Malz**, R. Sorba. *submitted to ApJ 30 September 2024*. “A holistic exploration of the potentially recoverable redshift information of Stage IV photometric galaxy surveys” ([arXiv:2409.20443](#))
Lead author: conceptualization, formal analysis, investigation, methodology, project administration, software, supervision validation, visualization, writing
31. **A.I. Malz**, F. Lanusse, J.F. Crenshaw, B. Scott, M.L. Graham, X. Li. *accepted to ApJS 17 September 2024*. “An information-based metric for observing strategy optimization, demonstrated in the context of photometric redshifts with applications to cosmology” ([arXiv:2104.08229](#))
Lead author: conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, software, validation, visualization, writing
30. I. Mendoza, A. Torchylo, T. Sainrat, A. Guinot, A. Boucaud, M. Paillasa, C. Avestruz, P. Adari, E. Aubourg, B. Biswas, J. Buchanan, P. Burchat, C. Doux, R. Joseph, S. Kamath, **A.I. Malz**, G. Merz, H. Miyatake, C. Roucelle, T. Zhang, LSST-DESC. *submitted 11 September 2024*. “The Blending ToolKit: A simulation framework for evaluation of galaxy detection and deblending” ([arXiv:2409.06986](#))
Contributor: validation, visualization
29. Q. Hang, B. Joachimi, E. Charles, J.F. Crenshaw, P. Larsen, **A.I. Malz**, S. Schmidt, Z. Yan, T. Zhang, LSST-DESC. *submitted to MNRAS 24 August 2024*. “Impact of survey spatial variability on galaxy redshift distributions and the cosmological 3×2 -point statistics for the Rubin Legacy Survey of Space and Time (LSST)” ([arXiv:2409.02501](#))
Contributor: conceptualization, funding acquisition, software, writing
28. K.M. de Soto, A. Villar, E. Berger, S. Gomez, G. Hosseinzadeh, D. Branton, S. Campos, M. DeLucchi, J. Kubica, O. Lynn, K. Malanchev, **A.I. Malz**. *accepted to AAS Journals 25 July 2024*. “Superphot+: Realtime Fitting and Classification of Supernova Light Curves” ([arXiv:2403.07975](#))
Contributor: conceptualization, methodology
27. J.F. Crenshaw, J.B. Kalmbach, A. Gagliano, Z. Yan, A.J. Connolly, **A.I. Malz**, S.J. Schmidt. *submitted to AJ 8 May 2024*. “Probabilistic Forward Modeling of Galaxy Catalogs with Normalizing Flows” ([arXiv:2405.04740](#))
Contributor: conceptualization, funding acquisition, validation
26. J. Lee, M. Sako, R. Kessler, **A.I. Malz**. *submitted to ApJ 5 May 2024*. “Astrometric Redshifts of Supernovae” ([arXiv:2405.04522](#))
Contributor: data curation, software, writing
25. **A.I. Malz**, M. Dai, K.A. Ponder, E.E.O. Ishida, S. Gonzalez-Gaitain, R. Durgesh, A. Krone-Martins, R.S. de Souza, N. Kenamer, S. Sreejith, L. Galbany. *accepted to A&A 2 May 2024*. “Are classification metrics good proxies for SN Ia cosmological constraining power?” ([arXiv:2305.14421](#))
Lead author: conceptualization, formal analysis, investigation, methodology, software, validation, visualization, writing
24. D. Oldag, M. DeLucchi, W. Beebe, D. Branton, S. Campos, C.O. Chandler, C. Christofferson, A. Connolly, J. Kubica, O. Lynn, K. Malanchev, **A.I. Malz**, R.

- Mandelbaum, S. McGuire, C. Wenneman. 2024. RNAAS 8 5 141. “A Python Project Template for Healthy Scientific Software”
Contributor: conceptualization, software, writing
23. I. Moskowitz, E. Gawiser, J.F. Crenshaw, B.H. Andrews, **A.I. Malz**, S. Schmidt. 2024. ApJL 967 L6. “Improving Photometric Redshift Estimates with Training Sample Augmentation”
Contributor: software
22. A. Gagliano, G. Contardo, D. Foreman-Mackey, **A.I. Malz**, P.D. Aleo. 2023. ApJ 954 6. “First Impressions: Early-Time Classification of Supernovae using Host Galaxy Information and Shallow Learning”
Contributor: data curation, resources, software, writing
21. R. Hložek, **A.I. Malz**, K.A. Ponder, M. Dai, G. Narayan, E.E.O. Ishida, T. Allam Jr., A. Bahmanyar, R. Biswas, L. Galbany, S.W. Jha, D.O. Jones, R. Kessler, M. Lochner, A.A. Mahabal, K.S. Mandel, J.R. Martinez-Galarza, J.D. McEwen, D. Muthukrishna, H.V. Peiris, C.M. Peters, C.N. Setzer. 2023. ApJS 267 25. “Results of the Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC)”
Lead author: conceptualization, formal analysis, investigation, methodology, visualization, writing
20. M. Lokken, A. Gagliano, G. Narayan, R. Hložek, R. Kessler, J.F. Crenshaw, L. Salo, C.S. Alves, D. Chatterjee, M. Vincenzi, **A.I. Malz**. 2023. MNRAS 520 2. “The Simulated Catalogue of Optical Transients and Correlated Hosts (SCOTCH)”
Contributor: conceptualization, data curation, methodology
Please pardon the apparent gap in publications as a result of the global pandemic limiting collaboration opportunities during the preceding two years.
19. N. Stylianou, **A.I. Malz**, P. Hatfield, J.F. Crenshaw, J. Gschwend. 2021. PASP 134 1034. “The sensitivity of GPz estimates of photo-z posterior PDFs to realistically complex training set imperfections”
Lead author: conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, software, supervision, validation, visualization, writing
18. **A.I. Malz**, D.W. Hogg. 2021. ApJ 928 127. “How to obtain the redshift distribution from probabilistic redshift estimates”
Lead author: conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, software, validation, visualization, writing
17. M. Agüena, C. Avestruz, C. Combet, S. Fu, R. Herbonnet, **A. I. Malz**, M. Penna-Lima, M. Ricci, S. D. P. Vitenti, L. Baumont, H. Fan, M. Fong, M. Ho, M. Kirby, C. Payerne, D. Boutigny, B. Lee, B. Liu, T. McClintock, H. Miyatake, C. Sifón, A. von der Linden, H. Wu, M. Yoon. 2021. MNRAS 508 4 6092. “CLMM: a LSST-DESC Cluster weak Lensing Mass Modeling library for cosmology”
Lead author: conceptualization, funding acquisition, methodology, project administration, software, validation, writing
16. B. Dey, J.A. Newman, B.H. Andrews, R. Izbicki, A.B. Lee, D. Zhao, M.M. Rau, **A.I. Malz**. 2021. Fourth Workshop on Machine Learning and the Physical Sciences NeurIPS. “Re-calibrating Photometric Redshift Probability Distributions Using Feature-space Regression” (arXiv:2110.15209)
Contributor: conceptualization, methodology, supervision, writing
15. J. Zuntz, F. Lanusse, **A.I. Malz**, A.H. Wright, A. Slosar, B. Abolfathi, D. Alonso, A. Bault, C.R. Bom, M. Brescia, A. Broussard, J.-E. Campagne, S. Cavuoti, E.S. Cypriano,

- B.M.O. Fraga, E. Gawiser, E.J. Gonzalez, D. Green, P. Hatfield, K. Iyer, D. Kirkby, A. Nicola, E. Nourbakhsh, A. Park, G. Teixeira, K. Heitmann, E. Kovacs, Y.-Y. Mao. 2021. OJA 4. “The LSST-DESC 3x2pt Tomography Optimization Challenge”
Lead author: conceptualization, formal analysis, methodology, visualization, writing
14. **A.I. Malz**. 2020. PRD 103 083502. “How NOT to obtain the redshift distribution from probabilistic redshift estimates”
Sole author: conceptualization, formal analysis, investigation, methodology, project administration, resources, writing
 13. B. Moews, M.S. Schmitz, A.J. Lawler, J. Zuntz, **A.I. Malz**, R.S. de Souza, R. Vilalta, A. Krone-Martins, E.E.O. Ishida. 2020. MNRAS 500 1 859. “Ridges in the Dark Energy Survey for cosmic trough identification”
Contributor: conceptualization, methodology, writing
 12. S.J. Schmidt, **A.I. Malz**, J.Y.H. Soo, I.A. Almosallam, M. Brescia, S. Caviuoti, J. Jochen-Tanugi, A.J. Connolly, J. DeRose, P.E. Freeman, M.L. Graham, K.G. Iyer, M.J. Jarvis, J.B. Kalmbach, E. Kovacs, A.B. Lee, G. Longo, C.B. Morrison, J.A. Newman, E. Nourbakhsh, E. Nuss, T. Pospisil, H. Tranin, R.H. Wechsler, R. Zhou, R. Izbicki. 2020. MNRAS 499 2 1587. “Evaluation of probabilistic photometric redshift estimation approaches for LSST”
Lead author: conceptualization, formal analysis, investigation, methodology, project administration, software, supervision, validation, visualization, writing
 11. N. Kenamer, E.E.O. Ishida, S. Gonzalez-Gaitan, R.S. de Souza, A. Ihler, K. Ponder, R. Vilalta, A. Moller, D.O. Jones, M. Dai, A. Krone-Martins, B. Quint, S. Sreejith, **A.I. Malz**, L. Galbany. 2020. IEEE Symposium Series on Computational Intelligence. “Active learning with RESSPECT: Resource allocation for extragalactic astronomical transients” ([arXiv:2010.05941](https://arxiv.org/abs/2010.05941))
Contributor: conceptualization, methodology
 10. N. Dalmaso, T. Pospisil, A.B. Lee, R. Izbicki, P.E. Freeman, **A.I. Malz**. 2019. As. & Com. 20 100362. “Conditional Density Estimation Tools in Python and R with Applications to Photometric Redshifts and Likelihood-Free Cosmological Inference”
Contributor: data curation, writing
 9. B. Moews, R.S. de Souza, E.E.O. Ishida, **A.I. Malz**, C. Heneka, R. Vilalta, J. Zuntz. 2019. PRD 99 123529. “Stress testing the dark energy equation of state imprint on supernova data”
Contributor: conceptualization, formal analysis, investigation, methodology, validation, writing
 8. T. Cantat-Gaudin, A. Krone-Martins, N. Sedaghat, A. Farahi, R.S. de Souza, R. Skolidis, **A.I. Malz**, S. Macedo, B. Moews, C. Jordi, A. Moitinho, A. Castro-Ginard, E.E.O. Ishida, C. Heneka, A. Boucaud, A.M.M. Trindade. 2019. A&A 624 A126. “Gaia DR2 unravels incompleteness of nearby cluster population: New open clusters in the direction of Perseus”
Contributor: conceptualization, writing
 7. **A.I. Malz**, R. Hložek, T. Allam Jr., A. Bahmanyar, R. Biswas, M. Dai, L. Galbany, E.E.O. Ishida, S.W. Jha, D.O. Jones, R. Kessler, M. Lochner, A.A. Mahabal, K.S. Mandel, J.R. Martinez-Galarza, J.D. McEwen, D. Muthukrishna, G. Narayan, H.V. Peiris, C.M. Peters, K. Ponder, C.N. Setzer. 2019. AJ 158 5 171. “The Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC): Selection of a performance metric for classification probabilities balancing diverse science goals”
Lead author: conceptualization, data curation, formal analysis, investigation, methodology, project administration, software, supervision, validation, visualization, writing

6. C. Chang, M. Wang, S. Dodelson, T. Eifler, C. Heymans, M. Jarvis, M.J. Jee, S. Joudaki, E. Krause, **A.I. Malz**, R. Mandelbaum, I. Mohammed, M. Schneider, M. Simet, M.A. Troxel, J. Zuntz. 2018. MNRAS 482 3 3696. “[A Unified Analysis of Four Cosmic Shear Surveys](#)”
Contributor: methodology, writing
5. **A.I. Malz**, P.J. Marshall, M.L. Graham, S.J. Schmidt, J. DeRose, R. Wechsler. 2018. AJ 156 0 35. “[Approximating photo-z PDFs for large surveys](#)”
Lead author: conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, software, validation, visualization, writing
4. A.S. Leung, V. Acquaviva, E. Gawiser, R. Ciardullo, E. Komatsu, **A.I. Malz**, G.R. Zeimann, J.S. Bridge, N. Drory, J.J. Feldmeier, S.L. Finkelstein, K. Gebhardt, C. Gronwall, A. Hagen, G.J. Hill, D.P. Schneider. 2017. ApJ 843 2 130. “[Bayesian Redshift Classification of Emission-Line Galaxies with Photometric Equivalent Widths](#)”
Contributor: conceptualization
3. J.S. Bridge, C. Gronwall, R. Ciardullo, A. Hagen, G. Zeimann, **A.I. Malz**, V. Acquaviva, D.P. Schneider, N. Drory, K. Gebhardt, S. Jogee. 2015. ApJ 799 2 205. “[Physical and Morphological Properties of \[O II\] Emitting Galaxies in the HETDEX Pilot Survey](#)”
Contributor: conceptualization, methodology
2. R. Ciardullo, G.R. Zeimann, C. Gronwall, H. Gebhardt, D.P. Schneider, A. Hagen, **A.I. Malz**, G.A. Blanc, G.J. Hill, N. Drory, E. Gawiser. 2014. ApJ 796 1 64. “[HST Emission Line Galaxies at \$z \sim 2\$: The Ly-alpha Escape Fraction](#)”
Contributor: conceptualization, methodology
1. A. Hagen, R. Ciardullo, C. Gronwall, V. Acquaviva, J. Bridge, G.R. Zeimann, G.A. Blanc, N.A. Bond, S.L. Finkelstein, M. Song, E. Gawiser, D.B. Fox, H. Gebhardt, **A.I. Malz**, D.P. Schneider, N. Drory, K. Gebhardt, G.J. Hill. 2014. ApJ 786 1 59. “[Spectral Energy Distribution Fitting of HETDEX Pilot Survey Lyman-alpha Emitters in COSMOS and GOODS-N](#)”
Contributor: conceptualization, methodology

Published Software

All of AIM’s code, including work in progress, is publicly available on GitHub; these have formal releases with DOIs.

- LSST-DESC RAIL Topical Team (led by **A.I. Malz**). 2023. “[RAIL](#)”. DOI:10.5281/zenodo.7017551
Lead author: conceptualization, funding acquisition, methodology, project administration, software, supervision, validation, writing (documentation)
- LSST-DESC RAIL Topical Team (led by **A.I. Malz**). 2022. “[qp](#)”. DOI:10.5281/zenodo.7815296
Lead author: conceptualization, funding acquisition, methodology, project administration, software, supervision, validation, writing (documentation)
- LSST-DESC CLMassMod Team (led by **A.I. Malz**). 2021. “[CLMM](#)”. DOI:10.5281/zenodo.5596167
Lead author: conceptualization, funding acquisition, methodology, project administration, software, supervision, writing (documentation)
- A.I. Malz**. 2020. “[chippr](#)”. DOI:10.5281/zenodo.4085252
Sole author: conceptualization, funding acquisition, methodology, project administration, resources, software, validation, visualization, writing (documentation)
- A.I. Malz**, et al. 2019. “[ProClam](#)”. DOI:10.5281/zenodo.3352639
Lead author: conceptualization, methodology, software, validation, visualization, writing (documentation)
- B. Brewer, T.K. Leung & **A.I. Malz**. 2018. “[StarStudded](#)”. DOI:10.5281/zenodo.1410782
Contributor: software
- A.I. Malz** & P.J. Marshall. 2017. “[qp](#)”. DOI:10.5281/zenodo.1133465
Lead author: conceptualization, methodology, software, validation, visualization, writing (documentation)

Non-standard Publications

K. Breivik, et al. (incl. **A.I. Malz**) 2022. *whitepaper*. “From Data to Software to Science with the Rubin Observatory LSST ” ([arXiv:2208.02781](#))

Contributor: conceptualization, investigation, writing

LSST-DESC, et al. (incl. **A.I. Malz**) 2020. *LSST-DESC Research Note*. “The LSST-DESC Science Roadmap”

Contributor: conceptualization, project administration, writing

T. Allam Jr., A. Bahmanyar, R. Biswas, M. Dai, L. Galbany, R. Hložek, E.E.O. Ishida, S.W. Jha, D.O. Jones, R. Kessler, M. Lochner, A.A. Mahabal, **A.I. Malz**, K.S. Mandel, J.R.

Martinez-Galarza, J.D. McEwen, D. Muthukrishna, G. Narayan, H.V. Peiris, C.M. Peters, K. Ponder, C.N. Setzer. *LSST-DESC Research Note*. 2018. “The Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC): Data set” ([arXiv:1810.00001](#))

Contributor: conceptualization, methodology, software

A.I. Malz, et al. 2018. “Dance Your Ph.D. 2018/9: Probabilistic methods for cosmological analysis with uncertainty-dominated data” (educational music video)

Lead author: conceptualization, funding acquisition, methodology (choreography), project administration (production), resources (costumes), software (video editing & web maintenance), supervision, visualization

P.J. Marshall, et al. (incl. **A.I. Malz**) 2017. *whitepaper*. “Science-Driven Optimization of the LSST Observing Strategy” ([arXiv:1708.04058](#))

Contributor: conceptualization, methodology, writing

A.I. Malz. 2017. Cooper Square Review. “Going nowhere fast” (science communication essay)

Sole author: conceptualization, writing

Citeable Presentations

A.I. Malz & the Extended PLAsTiCC (ELAsTiCC) Team. 2023. American Astronomical Society, AAS Meeting #241, id. 117.04 “ELAsTiCC: Metrics of probabilistic classifications of the alert stream” (contributed talk)

A.I. Malz & the LSST-DESC RAIL Team. 2023. American Astronomical Society, AAS Meeting #241, Astronomy and Cloud Computing Special Session, id. 358.01. “All aboard! A LINCC Framework for extragalactic science using RAIL” (contributed poster)

A.I. Malz. 2021. American Astronomical Society, AAS Meeting #238, Machine Learning in Astronomy Meeting-in-a-Meeting, id. 103.02. “Proceed with caution: how, and how not, to use machine learning to probe cosmology” (invited talk)

A.I. Malz, F. Lanusse, J.F. Crenshaw, M.L. Graham. 2021. American Astronomical Society, AAS Meeting #238, id. 230.04. “TheLastMetric: an information-based observing strategy metric for photometric redshifts, cosmology, and more” (contributed poster)

J.F. Crenshaw, J.B. Kalmbach, **A.I. Malz**, A.J. Connolly. 2021. American Astronomical Society, AAS Meeting #238, id. 230.01. “PZFlow: normalizing flows for cosmology, with applications to forward modeling galaxy photometry” (contributed poster)

A.I. Malz. 2021. American Astronomical Society, AAS Meeting #237, LSST-DESC Special Session, id. 443.05. “The DESC Photometric Redshifts Working Group: Challenges & Opportunities” (contributed talk)

A.I. Malz. 2019. American Astronomical Society, AAS Meeting #233, Surveys & Large Programs, id. 313.05D. “Probabilistic data analysis methods for large photometric surveys” (contributed talk)

A.I. Malz. 2019. American Astronomical Society, AAS Meeting #233, Larger Efforts in Education & Public Outreach, id. 212.05. “The Photometric LSST Astronomical Time Series Classification Challenge (PLAsTiCC): challenge design and evaluation criteria” (contributed talk)

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