

PATRICK KAMIENESKI

Exploration Postdoctoral Fellow

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EDUCATION

09/2015–02/2023 **University of Massachusetts**, Amherst, MA

Ph.D. Astronomy

Advisor: Dr. Min Yun.

09/2011–05/2015 **Bowdoin College**, Brunswick, ME

B.A. Physics, Mathematics, *cum laude*.

Minor: French

EMPLOYMENT

10/2022–present **School of Earth and Space Exploration Postdoctoral Fellow**, Arizona State University, Tempe, AZ.

10/2016–09/2022 **Graduate Research Assistant and Teaching Assistant**, Dr. Min Yun, University of Massachusetts Amherst.

2018–2019 **Summer Pre-college Program Course Coordinator**, University of Massachusetts.

09/2015–10/2016 **Graduate Teaching Assistant**, Dr. Daniel Wang, University of Massachusetts.

06/2014–09/2014 **Undergraduate Research Assistant (NSF-REU)**, Dr. Lynn Matthews, MIT Haystack Observatory, Westford, MA.

09/2012–05/2015 **Undergraduate Teaching Assistant**, Department of Mathematics, Bowdoin College.

PUBLICATIONS

2023 **Are JWST/NIRCam color gradients in a lensed $z = 2.3$ dusty star-forming galaxy due to central dust attenuation or inside-out galaxy growth?, in final stages of preparation.**

P. Kamieneski, B. Frye, M. Pascale, S. Cohen, R. Windhorst, R. Jansen, C. Cheng, H. Yan, J. Summers, T. Carleton, M. Yun, K. Harrington, N. Foo, J. Diego, C. Conselice, S. Tompkins, S. Driver, D. Coe, N. Grogin, A. Koekemoer, M. Marshall, N. Pirzkal, A. Robotham, R. Ryan, C. Willmer

2023 **ALMA reveals a rotating gas disk in a paradoxical low-mass, ultra-dusty galaxy at $z = 4.274$, in final stages of preparation.**

Alexandra Pope, J. McKinney, P. Kamieneski, A. Battisti, G. Brammer, E. Keller, D. Marchesini, E. Murphy, K. Whitaker

2023 **Hubble Space Telescope Imaging of 22 Planck-selected Ultraluminous Dusty Star-Forming Galaxies at $1 < z < 3$: Ubiquitous Strong Gravitational Lensing, in final stages of preparation.**

James D. Lowenthal, P. Kamieneski, M. S. Yun, K. Harrington, B. Frye, R. J. Terlevich, Q. D. Wang, D. Berman, I. Aretxaga, D. Hughes

- 2023 **PASSAGES: the wide-ranging, extreme intrinsic properties of *Planck*-selected, lensed dusty star-forming galaxies**, *submitted to journal* [ADS].
Kamieneski, Patrick S.; Yun, Min S.; Harrington, Kevin C.; Lowenthal, James D.; Wang, Q. Daniel; Frye, Brenda L.; Jiménez-Andrade, Eric F.; Vishwas, Amit; Cooper, Olivia; Pascale, Massimo; Foo, Nicholas; Berman, Derek; Englert, Anthony Garcia Diaz, Carlos;
- 01/2023 **JWST's PEARLS: A JWST/NIRCam view of ALMA sources**, *ApJL*, 942, L19 [ADS].
Cheng, Cheng; et al.
- 01/2023 **JWST PEARLS: Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results**, *AJ*, 165, 13 [ADS].
Windhorst, Rogier A.; et al.
- 10/2022 **Unscrambling the lensed galaxies in JWST images behind SMACS0723**, *ApJL*, 938, L6 [ADS].
Pascale, Massimo; Frye, B. L.; Diego, J.; Furtak, L. J.; Zitrin, A.; Broadhurst, T.; Conselice, C.; Dai, L.; Ferreira, L.; Adams, N. J.; Kamieneski, P.; Foo, N.; Kelly, P.; Chen, W.; Lim, J.; Meena, A. K.; Wilkins, S. M.; Bhatawdekar, R.; Windhorst, R. A.
- 09/2022 **PASSAGES: The Large Millimeter Telescope and ALMA Observations of Extremely Luminous High Redshift Galaxies Identified by the *Planck***, *MNRAS*, 515, 3911 [ADS].
Berman, Derek A.; Yun, Min S.; Harrington, K. C.; Kamieneski, P.; Lowenthal, J.; Frye, B. L.; Wang, Q. D.; Wilson, G. W.; Aretxaga, I.; Chavez, M.; Cybulski, R.; De la Luz, V.; Erickson, N.; Ferrusca, D.; Hughes, D. H.; Montaña, A.; Narayanan, G.; Sánchez-Argüelles, D.; Schloerb, F. P.; Souccar, K.; Terlevich, E.; Terlevich R.; Zavala, J. A.
- 06/2022 **Possible Ongoing Merger Discovered by Photometry and Spectroscopy in the Field of the Galaxy Cluster PLCK G165.7+67.0**, *ApJ*, 932, 85 [ADS].
Pascale, Massimo; Frye, B.; Dai, L.; Foo, N.; Qin, Y.; Leimbach, R.; Bauer, A.; Merlin, E.; Coe, D.; Diego, J.; Yan, H.; Zitrin, A.; Cohen, S.; Conselice, C.; Dole, H.; Harrington, K.; Jansen, R.; Kamieneski, P.; Windhorst, R.A.; Yun, M.
- 02/2021 **Turbulent Gas in Lensed *Planck*-selected Starbursts at $z \sim 1 - 3.5$** , *ApJ*, 908, 95 [ADS].
Harrington, Kevin C.; Weiss, A.; Yun, M. S.; Magnelli, B.; Sharon, C. E.; Leung, T. K. D.; Vishwas, A.; Wang, Q. D.; Frayer, D. T.; Jiménez-Andrade, E. F.; Liu, D.; García, P.; Romano-Díaz, E.; Frye, B. L.; Jarugula, S.; Bădescu, T.; Berman, D.; Dannerbauer, H.; Díaz-Sánchez, T.; Grassitelli, L.; Kamieneski, P.; Kim, W. J.; Kirkpatrick, A.; Lowenthal, J. D.; Messias, H.; Puschig, J.; Stacey, G. J.; Torne, P.; Bertoldi, F.
- 10/2019 **CHANG-ES XV: Large-scale magnetic field reversals in the radio halo of NGC 4631**, *A&A*, 632, A11 [ADS].
Mora-Partiarroyo, Silvia Carolina; Krause, M.; Basu, A.; Beck, R.; Wiegert, T.; Irwin, J.; Henriksen, R.; Stein, Y.; Vargas, C.; Heesen, V.; Walterbos, R.; Rand, R.; Heald, G.; Li, J.; Kamieneski, P.; English, J.
- 10/2019 **CHANG-ES XIV: Cosmic-ray propagation and magnetic field strengths in the radio halo of NGC 4631**, *A&A*, 632, A10 [ADS].
Mora-Partiarroyo, Silvia Carolina; Krause, M.; Basu, A.; Beck, R.; Wiegert, T.; Irwin, J.; Henriksen, R.; Stein, Y.; Vargas, C.; Heesen, V.; Walterbos, R.; Rand, R.; Heald, G.; Li, J.; Kamieneski, P.; English, J.
- 09/2019 **The 'Red Radio Ring': ionized and molecular gas in a starburst/active galactic nucleus at $z \sim 2.55$** , *MNRAS*, 488, 1489 [ADS].
Harrington, K. C.; Vishwas, A.; Weiß, A.; Magnelli, B.; Grassitelli, L.; Zajaček, M.; Jiménez-Andrade, E. F.; Leung, T. K. D.; Bertoldi, F.; Romano-Díaz, E.; Frayer, D. T.; Kamieneski, P.; Riechers, D.; Stacey, G. J.; Yun, M. S.; Wang, Q. D.

- 08/2018 **The gravitationally unstable gas disk of a starburst galaxy 12 billion years ago**, Nature, 560, 613 [ADS].
Tadaki, K.; Iono, D.; Yun, M. S.; Aretxaga, I.; Hatsukade, B.; Hughes, D. H.; Ikarashi, S.; Izumi, T.; Kawabe, R.; Kohno, K.; Lee, M.; Matsuda, Y.; Nakanishi, K.; Saito, T.; Tamura, Y.; Ueda, J.; Umehata, H.; Wilson, G. W.; Michiyama, T.; Ando, M.; **Kamieneski, P.**
- 01/2017 **CHANG-ES VIII. Uncovering hidden AGN activity in radio polarization**, MNRAS, 464, 1333 [ADS].
Irwin, J. A.; Schmidt, P.; Damas-Segovia, A.; Beck, R.; English, J.; Heald, G.; Henriksen, R. N.; Krause, M.; Li, J.-T.; Rand, R. J.; Wang, Q. D.; Wiegert, T.; **Kamieneski, P.**; Paré, D.; Sullivan, K.

OBSERVATIONAL PROGRAMS (PI)

- 2022 **Atacama Large Millimeter/submillimeter Array (ALMA)**, 2022.1.01311.S, Cycle 9 (PI: **P. Kamieneski**).
Star Formation Beyond the Eddington Limit? 100pc-scale Dust Continuum Imaging in Strongly-lensed Dusty Starbursts
Time awarded: 15.5 hrs
- 2021 **Atacama Large Millimeter/submillimeter Array (ALMA)**, 2021.1.00499.S, Cycle 8 (PI: **P. Kamieneski**).
Probing Gas, Dust, Stars, and Star Formation Activity down to 100-pc Scales using Strong Gravitational Lensing
Time awarded: 18.3 hrs
- 2019 **Atacama Large Millimeter/submillimeter Array (ALMA)**, 2019.1.01197.S, Cycle 7 (PI: **P. Kamieneski**).
Probing Gas, Dust, Stars, and Star Formation Activity down to 100-pc Scales using Strong Gravitational Lensing
Time awarded: 7.4 hrs
- 2018 **Large Millimeter Telescope (LMT)**, 2018-S1-MU-7 (PI: **P. Kamieneski**).
AzTEC Photometric Imaging of Planck-selected Dusty Star-Forming Galaxies
Time awarded: 1.5 hrs, not observed
- 2018 **Karl G. Jansky Very Large Array (JVLA)**, 18A-399 (PI: **P. Kamieneski**).
VLA Study of Hyperluminous SMGs Identified from Planck All-Sky Survey
Time awarded: 39 hrs

OBSERVATIONAL PROGRAMS (Co-I)

- 2022 **XMM-Newton**, AO-22-092283 (PI: C. Garcia Diaz).
Understanding the role of AGN in HyLIRGs: study of a strongly lensed sample
Time awarded: 225 ksec
- 2022 **European Southern Observatory Very Large Telescope (ESO VLT)/Enhanced Resolution Imaging Spectrograph (ERIS)**, SV 110.258S (PI: D. Liu).
Dissecting the Most Massive Strongly Lensed SFGs (Pilot)
Time awarded: 2.0 hrs
- 2022 **Gemini-South**, GN-2022B-FT-107 (PI: C. Garcia Diaz).
Spectroscopic determination of the relationship between a luminous X-ray AGN and a strongly lensed HyLIRG at $z = 3.55$
Time awarded: 4.9 hrs
- 2022 **ALMA**, 2022.1.01282.S (PI: K. Harrington).
ACA mosaic search for dusty sources in and around the critical curves of Planck-selected strong lensing clusters
Time awarded: 137.9 hrs

- 2022 **Gemini-South**, GN-2022A-FT-209 (PI: O. Cooper).
Spectroscopic determination of the relationship between a luminous X-ray AGN and a strongly lensed HyLIRG at $z = 3.55$
Time awarded: 3.8 hrs, not observed
- 2021 **XMM-Newton**, AO-21-090266 (PI: B. Frye).
Observations of the JWST/GTO Binary Cluster PLCK G165.7+67.0
Time awarded: 49 ksec
- 2021 **ALMA**, 2021.1.00447.S (PI: M. Yun).
The Origin of [C II] and [N II] Emission in High- z Dusty Starbursts (Cycle8)
Time awarded: 10.6 hrs
- 2021 **ALMA**, 2021.2.00888.S (PI: K. Harrington).
ACA B7 and B8 Mosaic of a Planck-selected cluster-lensed dusty protocluster at $z = 2.7$
Time awarded: 21.0 hrs
- 2021 **ALMA**, 2021.1.00353.S (PI: K. Harrington).
Probing gas excitation variations in lensed starbursts at cosmic noon via sub-kpc imaging of [CI] and the CO ladder
Time awarded: 17.0 hrs
- 2021 **ALMA**, 2021.1.00272.S (PI: A. Pope).
Small but mighty: Reconciling a paradoxical low-mass, ultra-dusty galaxy at $z = 4.27$
Time awarded: 16.7 hrs
- 2021 **Gemini-South**, GS-2021B-FT-102 (PI: O. Cooper).
Comprehensive Lens Characterization for a Hyperluminous DSFG at $z = 2$
Time awarded: 1.3 hrs
- 2020 **XMM-Newton**, AO-20-088272 (PI: Q. D. Wang).
X-raying hyperluminous sub-millimeter galaxies via strong gravitational lenses
Time awarded: 544 ksec (Large Program)
- 2020 **Submillimeter Array (SMA)**, 2020A-S014 (PI: K. Harrington).
Rest-frame 775 - 1730 GHz ISM Diagnostics of the Most IR Luminous, Lensed Planck Starburst at $z = 3$
Time awarded: 29 hrs
- 2019 **ALMA**, 2019.1.01636.S (PI: M. Yun).
The Origin of [C II] and [N II] Emission in High- z Dusty Starbursts
Time awarded: 22.7 hrs
- 2018 **JVLA**, 18B-275 (PI: K. Harrington).
Resolved Imaging of Cold Gas Reservoirs in Strongly Lensed Planck Galaxies
Time awarded: 134 hrs
- 2018 **Institut de radioastronomie millimétrique (IRAM) 30m Telescope**, 201-18 (PI: K. Harrington).
Dense Gas in Strongly Lensed High- z Starbursts Selected by Planck: A continuation
Time awarded: 61.5 hrs
- 2018 **APEX**, 0101.F-9503(A) (PI: K. Harrington).
Probing the Dense Star-forming ISM of Lensed $z \sim 2-3$ HyLIRGS via low- J H_2O and High- J CO Emission Lines
Time awarded: 95 hrs
- 2018 **Gemini-South**, GS-2018B-Q-123 (PI: J. Lowenthal).
Gravitational Lens Models for the Brightest Planck SMGs at $1 < z < 4$
Time awarded: 18.4 hrs
- 2018 **Large Millimeter Telescope (LMT)**, 2018-S1-MU-78 (PI: M. Yun).
LMT Study of Extremely Luminous Galaxies Identified using Planck and WISE
- 2018 **Gemini-South**, GS-2018A-Q-216 (PI: J. Lowenthal).
Gravitational Lens Models for the Brightest Planck SMGs at $1 < z < 4$
Time awarded: 10.5 hrs

- 2018 **Institut de radioastronomie millimétrique (IRAM) 30m Telescope, 170-17** (PI: K. Harrington).
Probing Physical Diagnostics of SF via CO SLEDs Out to the Highest-J Transitions in Strongly Lensed $z > 1$ HyLIRGs
 Time awarded: 86 hrs
- 2017 **ALMA, 2017.1.01214.S** (PI: M. Yun).
ALMA Study of the Hyperluminous SMGs Identified from Planck All-Sky Survey
 Time awarded: 22 hrs
- 2017 **Green Bank Telescope, 17B-305** (PI: K. Harrington).
CO(1-0) Probe of SF Supply for the Brightest Planck-LMT, High- z Galaxies
 Time awarded: 41.3 hrs
- 2016 **SMA, 2016B-S062** (PI: M. Yun).
Probing Dense Gas Powering SF/AGN Activities in High- z SMGs using Lensing
 Time awarded: 18 hrs

GRANTS & FELLOWSHIPS

- 2022 **AAS Rodger Doxsey Travel Prize, \$780.**
 Travel prize to present dissertation talk at AAS Meeting 239 (canceled due to COVID-19, deferred to AAS 240)
- 2022 **Mary Dailey Irvine Graduate Travel Award, \$1000.**
 AAS Meeting 239 (canceled due to COVID-19, deferred to AAS 240)
- 2020-2021 **NRAO Student Observing Support, \$27,790.**
 In support of ALMA program 2019.1.01197.S (PI: P. Kamienieski)
- 2019 **AAS/NSF International Travel Grant, \$608.**
 "Views on the Interstellar Medium in Galaxies in the ALMA Era" Conference 2019
- 2018 **AAS/NSF International Travel Grant, \$1426.**
 "The Universe as a Telescope" Conference 2018
- 2018 **AAS/NSF International Travel Grant, \$625.**
 EWASS Meeting 2018
- 2018 **Mary Dailey Irvine Graduate Travel Award, \$800.**
 EWASS Meeting 2018
- 06/2017-08/2017 **Massachusetts Space Grant Consortium Fellowship, \$5500.**
- 2017 **Mary Dailey Irvine Graduate Travel Award, \$600.**
 CHANG-ES Meeting 2017
- 2017 **Mary Dailey Irvine Graduate Travel Award, \$630.**
 AAS Meeting 229
- 06/2016-08/2016 **Massachusetts Space Grant Consortium Fellowship, \$5500.**
- 2016 **Mary Dailey Irvine Graduate Travel Award, \$1100.**
 15th Synthesis Imaging Workshop

INVITED TALKS

- 06/2022 **Parsec Institute, Université de Montréal, Montreal, QC, Canada (virtual).**
 Invited Talk: *Dissecting the Most Extreme Starburst Events in the Universe with Gravitational Lensing*
- 05/2022 **Cornell University Galaxy Lunch, Ithaca, NY (virtual).**
 Invited Talk: *Dissecting the Most Extreme Starburst Events in the Universe with Gravitational Lensing*

CONFERENCES, MEETINGS & CONTRIBUTED TALKS

- 02/2023 **Oases in the Cosmic Desert: Understanding the Structure of the Circumgalactic Medium**, Tempe, AZ.
Poster: *Using gravitational lensing to resolve massive rotating molecular disks around dusty starbursts at Cosmic Noon*
- 02/2023 **Early Disk-Galaxy Formation From JWST to the Milky Way**, Kuala Lumpur, Malaysia.
Poster: *Using Gravitational Lensing to Resolve the Rotating Molecular Disks of Dusty Starbursts at Cosmic Noon*
- 06/2022 **240th American Astronomical Society (AAS) Meeting**, Pasadena, CA.
Dissertation Talk: *Resolving Cosmic Noon: Planck-selected extremely-luminous dusty starbursts magnified by strong gravitational lensing* [ADS]
- 09/2019 **Views on the Interstellar Medium in Galaxies in the ALMA Era**, Bologna, Italy.
Contributed Talk: *Gas and star formation at sub-100 pc scales in lensed hyper-luminous SMGs at Cosmic Noon*
- 01/2019 **233rd American Astronomical Society (AAS) Meeting**, Seattle, WA.
Contributed Talk: *Multi-wavelength source reconstruction of gravitationally-lensed Planck-selected sub-mm galaxies* [ADS]
- 09/2018 **The Universe as a telescope: probing the cosmos at all scales with strong lensing**, Milan, Italy.
Contributed Talk: *Lensed Hyper-luminous SMGs Selected by Planck*
- 04/2018 **European Week of Astronomy and Space Science (EWASS)**, Liverpool, UK,
Symposium: "Weak and strong-lensing techniques to unveil mysteries of the Universe".
Contributed Talk: *Lensed Hyper-luminous SMGs Selected by Planck*
- 06/2017 **CHANG-ES Meeting 2017: The Impact of CHANG-ES**, Bochum, Germany.
Contributed Talk: *Bayesian Methods for Measuring Faraday Rotation*
- 01/2017 **229th American Astronomical Society (AAS) Meeting**, Grapevine, TX.
Poster: *Faraday rotation measure synthesis of UGC 10288* [ADS]
- 07/2016 **CHANG-ES Meeting 2016: Radio Halos of Galaxies**, Madison, WI.
Contributed Talk: *Faraday Rotation Measure Synthesis of UGC 10288, NGC 4845, NGC 3044*
- 06/2016 **15th Synthesis Imaging Workshop**, Socorro, NM.
Workshop: *JVLA/NRAO*
- 01/2015 **225th American Astronomical Society Meeting**, Seattle, WA.
Poster: *Using JVLA Observations of SiO Masers to Probe the Extended Atmosphere of an AGB Star: W Hydrae* [ADS]

TEACHING

- 01/2019–11/2020 **Primary Instructor of Record**, University of Massachusetts Dept. of Astronomy.
Astronomy 100 and 101: Exploring the Universe Lab Section (Spring 2019, Fall 2019, Spring 2020, Fall 2020). *Designed course content and prepared necessary lab materials for lab sections serving ~500 students; supervised other graduate TAs in teaching the course; migrated course content to virtual format in Spring/Fall 2020 during COVID-19 pandemic.*
- 2018–2019 **Summer Program Course Coordinator**, University of Massachusetts Dept. of Astronomy.
Directed an intensive two-week pre-college program covering Modern Astronomy; supervised graduate student teachers in offering traditional lectures, hands-on lab activities, observing nights, optical data reduction and analysis with Jupyter notebooks; maintained course website for students to access material.

- 09/2015–05/2021 **Lab/Lecture Teaching Assistant**, University of Massachusetts Dept. of Astronomy.
Astronomy 100: Exploring the Universe, 9 semesters total.
- 2016–2021 **Summer Program Lecturer**, University of Massachusetts Dept. of Astronomy.
Modern Astronomy: *Delivered lectures and introductory Python labs as part of a 2 to 3-week pre-college program.*
- 06/2013–08/2013 **Teaching Intern**, St. Paul's School Advanced Studies Program, Concord, NH.
Assisted Dr. Leslie Chamberlain in teaching an Introductory Astronomy summer course for high school seniors. Returned to give a guest lecture on gravitational lensing in July 2017.

MENTORING, OUTREACH, & PROFESSIONAL SERVICE

- 11/2022 **Volunteer for Earth and Space Exploration Open House**, Arizona State University School of Earth and Space Exploration.
- 06/2021–05/2022 **Undergraduate Research Advisor**, Smith College Dept. of Astronomy.
Co-advised undergraduate student (Lilah Mercadante '22) for honor's undergraduate thesis project alongside Prof. James Lowenthal.
- 2018–2022 **UMass Grad Student Senator**, University of Massachusetts Amherst.
Academic Years 2018-2019, 2019-2020, 2020-2021, 2021-2022
Represented the Astronomy department as a voting member in the university-wide Graduate Student Senate. Member of GSS Elections Committee, 2021.
- 2021–2022 **ALMA Distributed Proposal Reviewer**, Cycles 8 & 9.
- 2020–2021 **Member of Diversity, Equity, and Inclusion in Admissions & Recruitment Committee**, University of Massachusetts Amherst.
Grad student-led committee formed to offer suggested guidelines to promote DEI in the admissions process, including the instatement of grad student-conducted interviews in 2021.
- 2019 & 2022 **Volunteer Poster Judge**, Chambliss Competition, AAS Meetings 233 & 240.
- 03 & 12/2018 **Meet-an-Astronomer Day**, Springfield Prep Charter School, Longmeadow, MA.
Visited the 1st grade students at Springfield Prep and answered their questions about astronomy and the life of an astronomer.
- 2018 **Local Organizing Committee**, University of Massachusetts Amherst.
Past, Current and Future Galaxy Surveys: CANDELS Meeting and TolTEC Workshop
- 09/2015–05/2022 **Research Mentor**, University of Massachusetts Department of Astronomy.
Mentored a total of 7 undergraduate students in Dr. Min Yun's research group (Neil Shah '18, Silvana Delgado Andrade '19, Sam Clyne '19, Anthony Englert '21, and Lilah Mercadante '22) and in Dr. Daniel Wang's research group (Dylan Paré '17 and Kendall Sullivan '18).
- 2022–present **Member of National Postdoctoral Association.**
- 2014–present **Member of American Astronomical Society.**

TECHNICAL SKILLS

Software	Python
Experience	Common Astronomy Software Applications (CASA) LENSTOOL GALFIT SExtractor photutils BLOBCAT SAOImage ds9 / CARTA IRAF / PyRAF / astrodrizzle glue-viz L ^A T _E X HTML MIRIAD / Astronomical Image Processing System (AIPS) Mathematica
Observation Prep and Data Reduction Experience	Atacama Large Millimeter/submillimeter Array (ALMA), Jansky Very Large Array (JVLA), James Webb Space Telescope (JWST), Submillimeter Array (SMA), Hubble Space Telescope (WFC3, ACS)
Languages	English (native), French (professional)