# Patrick Kamieneski

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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. Marhsall, 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.; Puschnig, 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. Kamieneski)

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

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|---|---|
| Software Experience | Python<br>Common Astronomy Software Applications (CASA)<br>LENSTOOL, GALFIT, SExtractor, BLOBCAT<br>SAOImage ds9 / CARTA<br>IRAF / PyRAF / astrodrizzle<br>glue-viz<br>LaTeX<br>HTML<br>MIRIAD / Astronomical Image Processing System (AIPS)<br>Mathematica |
| Observation Prep and Data Reduction Experience | Atacama Large Millimeter/submillimeter Array (ALMA)<br>Jansky Very Large Array (JVLA)<br>Submillimeter Array (SMA)<br>Hubble Space Telescope (WFC3, ACS) |
| Languages | English (native), French (professional) |