

## Jessica Ryan Lu

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CONTACT INFORMATION	Astronomy Department University of California, Berkeley 501 Campbell Hall #3411 Berkeley, CA 94720-3411	<i>Voice:</i> (310)-709-0471 <i>Email:</i> <a href="mailto:jlu.astro@berkeley.edu">jlu.astro@berkeley.edu</a> <a href="http://astro.berkeley.edu/faculty-profile/jessica-lu">http://astro.berkeley.edu/faculty-profile/jessica-lu</a>
POSITION	<b>Associate Professor</b> , University of California, Berkeley	2020 - current
RESEARCH INTERESTS	Black holes, star and cluster formation, initial mass function, galactic centers, stellar dynamics, adaptive optics, astrometry, microlensing.	
EDUCATION	<b>University of California, Los Angeles</b> , Ph.D., Astrophysics <b>University of California, Los Angeles</b> , M.S., Astrophysics <b>Massachusetts Institute of Technology</b> , S.B., Physics	2008 2005 2000
PAST RESEARCH APPOINTMENTS	<b>Assistant Professor</b> , University of California, Berkeley <b>Assistant Astronomer</b> Institute for Astronomy, University of Hawaii <b>NSF Astronomy and Astrophysics Postdoctoral Fellow</b> , IfA Hawaii <b>Millikan Postdoctoral Fellow in Obs. Astronomy</b> , Caltech <b>NSF Graduate Research Fellow</b> , UCLA <b>Graduate Researcher</b> , UCLA <b>Undergraduate Researcher</b> , MIT	2016 - 2020 2013 - 2016 2011 - 2013 2008 - 2011 2005 - 2008 2003 - 2005 1997 - 2000
RESEARCH ACTIVITIES	Project Scientist, UH/TNO Adaptive Secondary Mirror Prototype Project Scientist, KAPA (Keck All-sky Precision Adaptive-optics) project Project Scientist, 'imaka Ground Layer Adaptive Optics Demonstrator Senior Member, Galactic Center Group @ UCLA Project Lead, UCLA Off-Axis PSF Reconstruction (AIROPA) co-PI, Keck Ground Layer Adaptive Optics Feasibility Study	2019 - present 2018 - present 2013 - present 2003 - present 2014 - present 2016 - 2018
HONORS AND AWARDS	2018 Prytanean Award 2014 Kavli Fellow 2011 NSF Astronomy Postdoctoral Fellowship (IfA, UH Manoa) 2008 Caltech Millikan Postdoctoral Fellowship in Observational Astronomy 2005 NSF Graduate Research Fellowship 2000 MIT Barrett Award for Excellence in Astrophysics 1997-1999 Spertus Family MIT Research Support Grant	
SERVICE AND OTHER EXPERIENCES	Professional Activities <ul style="list-style-type: none"><li>co-PI of AstroTech Summer School</li><li>Keck LIGER Science Team</li><li>Keck PSF-Reconstruction Project Science Team</li><li>WFIRST Milky Way SIT</li><li>WFIRST Astrometry Working Group</li><li>TMT Astrometry Advisory Group</li><li>TMT IRIS Instrument Science Team</li><li>TMT Co-convener, ISDT (Science Team) on Star and Planet Formation</li><li>Keck NIRC2 Distortion Characterization Effort</li><li>Keck Next Generation Adaptive Optics, Science Team</li><li>Keck Next Generation Adaptive Optics, Astrometry Technical Team</li><li>Keck NIRC2 Distortion Characterization Effort</li></ul>	2019-2023 2019-present 2016-present 2016-present 2016-present 2012-present 2008-present 2012-2019 2015 2006-2018 2006-2007 2007

Public Outreach

- Actively maintain @jlu.astro twitter account with 1279 followers.
- Worked with Iolani high school Girls Who Code program to provide astronomy applications.
- Designed and led physics-based inquiry activity for ~150 middle school girls as part of Space Center Houston's Diva Design Series.
- Collaborated with Adler Planetarium and University of Chicago Cosmus program in creating a 3D visualization of the stars orbiting the supermassive black hole at the center of the Milky Way. <http://astro.uchicago.edu/cosmus/projects/stararoundblackhole/>
- Collaborated with National Center for Supercomputing Applications to incorporate above with a simulated animation of the entire Galactic Center region
- Participated in filming and graphic design for the NSF funded NOVA show, *Monster of the Milky Way*, which exhibited research from our UCLA Galactic Center Group.

#### Conference and Workshop Organizing Committees

- Lead Organizer, KAPA Annual Science Meeting 2020
- SOC, Black Holes at All Scales, GMT 2020
- SOC, Adaptive Optics Workshop Week 2020
- SOC, SPIE Space Optical/IR/mm 2020
- SOC, Keck Science Meeting 2016,2019
- SOC, WFIRST Science in Our Own Backyard 2019
- SOC, Microlensing 22 2018
- SOC, SPIE Adaptive Optics 2016-2020
- SOC, TMT Forum 2015, 2017
- SOC, CfAO Fall Retreat 2017-2020
- SOC, Galactic Center Group Retreat 2015, 2017
- SOC, From Stars to Massive Stars Conference 2016
- SOC, AO4ELT4 2015
- Lead Organizer, Adaptive Optics Astrometry Workshop 2011
- Lead Organizer, Keck OSIRIS Workshop 2009

#### Telescope Time Allocation Committees

- IfA 2012-2015
- HST Panel 2011,2014
- Caltech Optical Observatories 2009,2011

#### Institutional Service

- UCB Faculty Search Committee 2019-2021
- UC Observatories Hiring Committees, various 2018-2019
- UCB Astro Grad Admissions Committee 2016-2019
- UCB Astro Climate Advisory Committee Chair 2018-current
- UCB Chapter Lead, Institute for Scientist & Engineering Educators 2016-2019
- UCB Astro Equity Advisor 2018
- UCB Astro Climate Advisory Committee 2016-2018
- UCB Astro Miller Fellow Selection Committee 2016-2017
- IfA Strategic Planning Committee 2014-2016
- IfA Grad Admissions Committee Member 2013-2016
- IfA Astro-ph Discussion Organizer 2013-2016
- IfA AstroCoffee Organizer 2012
- Caltech Astro Colloquium Committee Member 2011
- Caltech Astro-ph Discussion Organizer 2008-2011
- UCLA Astro Webmaster 2003-2006
- UCLA Faculty Rep. for Grad Students 2006-2007

#### National Service

- Roman Science Interest Group 2020
- NSF review committees 2019-2020
- AURA Member Representative for UCB 2019

- US-ELT Program Advisory Committee 2018-2019
- TMT NFIRAOS Final Design Review Committee 2018
- Gemini North AO Conceptual Design Review Committee 2019
- Referee for *ApJ*, *A&A*, and *MNRAS*
- Co-Founder of the AstroBetter.com wiki

#### Professional Memberships

- American Astronomical Society

#### Software Engineer

- 06/2000 - 05/2003, Alphablox Corporation, Mountain View, CA

#### TEACHING EXPERIENCE

*AstroTech Instrumentation Summer School* 2019-2023  
co-PI (in development, funded by Heising-Simons Foundation).

*Stars*, UC Berkeley Graduate Class (AY252), 2020

*Stellar Physics*, UC Berkeley Undergraduate Class (AY160), 2018-2020

*Cal-Bridge Mentor* 2017-current

*Intro. to Research*, UC Berkeley Graduate Class (AY290), 2017-2018  
Designed/taught new research and professional skills course for 1st year graduate students.

*Order of Magnitude Astrophysics*, UC Berkeley Graduate Class (AY250), Spring, 2017  
Designed/taught a new class focused on order-of-magnitude problem solving skills in astro-physical research for early graduate students.

*Intro. to Research*, IfA Graduate Class, Fall, 2013-2015, 2017  
Co-designed/taught new research and professional skills course for 1st year graduate students.

*Intro to Research Short-Course*, IfA Summer REU Summer 2012  
Developed and taught a short-course for incoming undergraduate researchers. Activities included a statistics inquiry and interactive discussions on abstract writing, efficiently reading scientific literature, and research methods.

*Participant*, CfAO/ISEE Professional Development Workshop 2006, 2012  
Training in inquiry (and other) teaching styles.

*Final Project Advisor*, Caltech AY 117 Fall 2010  
Developed 3 week final project for an undergraduate student in statistical a astronomy course.

*AO Lab Design*, CfAO Summer School 2006-2007  
Member of team that designed and taught three interactive optics labs that incorporate inquiry methods on an advanced topic previously taught as a lecture.

*Teaching Assistant*, UCLA, Astro. 81 Spring 2006, 2008  
Introductory astronomy course for astronomy/physics majors. Received Teaching Award.

*Teaching Assistant*, UCLA, Astro. 3 Fall 2004  
Introductory astronomy course for non-science majors. Received Teaching Award.

#### STUDENTS AND POSTDOCS

##### Postdocs

Sean Terry 2020-current

Matthew Freeman 2020-current

Dongwon Kim 2017-2020

Paolo Turri - current: U. Vic postdoc 2017-2019

### UC Berkeley Graduate Students

Hannah Gulick - PhD in progress 2020 -  
Emily Ramey - PhD in progress 2019 -  
Casey Lam - PhD in progress 2017 -  
Michael Medford - PhD in progress 2018 -  
Fatima Abdurrahman 2016-2019  
Siyao Jia - current: Google PhD 2020

### UH IfA Graduate Students

Max Service (co-advised with Mark Chun) - Gemini AO postdoc PhD 2019  
Matthew Hosek Jr. - current: UCLA postdoc PhD 2018  
Kelly Lockhart - data scientist at SAO NASA ADS PhD 2017  
Elizabeth Toller - 1st year project 2014-2015  
Evan Sinukoff - 2nd year project 2013-2014  
Laurie Urban - 2nd year project 2013-2014  
Ding Bon Huang M.S. 2013

### Undergraduate Students

Shrihan Agarwal (UCB) 2020-current  
Grace Jung (UCB) 2020-current  
Albert Tsai (UCB) 2020-current  
Lily Bhattacharjee (UCB Computer Science) 2020-current  
Cecily Lowe (UCB Physics) 2020-current  
Jesus Martinez (UCB) 2020-current  
Natasha Abrams (Harvard) 2020-current  
Ryota Inagaki (UCB Computer Science) 2020-current  
Kingsley Ehrich (UCB) 2020  
Ningyuan Xu (UCB) 2019-current  
Sam Rose (UCB) 2019-current  
Eden McEwen (UCB) 2019-current  
Yixian Chen (Tsinghua U) Fall 2019  
Surbhi Dhiman (UCB) 2019-2020  
Caylan Anderson (UCB) 2019-2020  
Ruoyi Yin (UCB) 2019-current  
Angela Cheng (UCB) 2019-current  
Blake Drechsler (UCB) 2019-current  
Carissa Lewis (UCB) 2019-current  
Prakamya Agrawal (UCB) 2019-2020  
William Sheu (UCB) Spring 2019  
Peter Boyle (UCB) 2018-2019  
Yingjie Cheng (Nanjing U) 2018-2019  
Steven Robinson (UCB) 2018  
Edward Broadberry (U. Manchester) 2018  
Delphine Veronese-Milin (UCB) 2017-2018  
Nicholas Rui (UCB) 2016-current  
Haynes Stephens (UCB) 2016-2018  
Nijaid Arredondo (UCB) 2016-2019  
Vida Khademi (UCB) 2016-2017  
Corey Mutnick (UH) 2015-2016  
Jennifer Greco (Caltech) Summer 2009  
Hal Cambier\* (UCLA) Summer 2006  
James Dunn\* (UCLA) 2006-2008  
Jill Naiman\* (UCLA) 2005-2006  
Lia Corralles\* (UCLA) Summer 2005  
Javiera Guedes\* (UCLA) Summer 2004

\*Served as a graduate student advisor for undergrads advised by Prof. Andrea Ghez

## High School Students

Annie Chu

Summer 2017

## PUBLICATIONS

**Summary** (see [ADS](#) for complete list and metrics)

† = *unrefereed publications*

\* = *directly supervised students or postdocs*

- [138] Zhang, K.; Bloom, J.S.; Gaudi, B.S.; Lanusse, F.; Lam, C.; Lu, J.; *Automating Inference of Binary Microlensing Events with Neural Density Estimation*, submitted
- [137] Rundquist, N.; Wright, S.A.; Schoeck, M.; Surya, A.; Lu, J.; Turri, P.; Chapin, E.L.; Chisholm, E.; Do, T.; Dunn, J.; Ghez, A.; Hayano, Y.; Johnson, C.; Larkin, J.E.; Riddle, R.L.; Sohn, J.M.; Suzuki, R.; Walth, G.; Zonca, A.; *The InfraRed Imaging Spectrograph (IRIS) for TMT: photometric characterization of anisoplanatic PSFs and testing of PSF-Reconstruction via AIROPA 2020*, SPIE, submitted
- [136] Wizinowich, P.; Chin, J.; Correia, C.; Lu, J.; Brown, T.; Casey, K.; Cetre, S.; Delorme, J.-R.; Gersa, L.; Hunter, L.; Lilley, S.; Ragland, S.; Surendran, A.; Wetherell, E.; Ghez, A.; Do, T.; Jones, T.; Liu, M.; Mawet, D.; Max, C.; Morris, M.; Treu, T.; Wright, S.; *Keck All Sky Precision Adaptive Optics*, 2020, SPIE, submitted
- [135] Chun, M.; Baranec, C.; Lai, O.; Lu, J.; Zhang, S.; Kuiper, S.; Jonker, W.; Maniscalco, M.; *A new adaptive secondary mirror for astronomy on the University of Hawaii 2.2-meter Telescope*, 2020, SPIE, submitted
- [134] Ramey, E.; Lu, J.R.; Yin, R.; Robinson, S.; Wizinowich, P.; Ragland, S.; Lyke, J.; Jia, S.; Sakai, S.; Gautam, A.; Do, T.; Hosek Jr., M.; Ghez, A.; Morris, M.; Becklin, E.; Matthews, K.; *Analyzing long-term performance of the Keck-II adaptive optics system*, 2020, SPIE, submitted
- [133] Kuiper, S.; Jonker, W.A.; van de Ven, E.; Voorhoeve, R.; Chun, M.; Lai, O.; Lu, J.; *Performance analysis of the adaptive secondary mirror for the UH2.2 telescope*, 2020, SPIE, submitted
- [132] Hinz, P.M.; Bowens-Rubin, R.; Baranec, C.; Bundy, K.; Chun, M.; Dillon, D.; Holden, B.; Jonker, W.; Kosiarek, M.; Kupke, R.; Kuiper, S.; Lai, O.; Lu, J.; Maniscalco, M.; Radovan, M.; Ragland, S.; Sallum, S.; Skemer, A.; Wizinowich, P.; *Developing adaptive secondary mirror concepts for the APF and W.M. Keck Observatory based on HVR technology*, 2020, SPIE, submitted
- [131] Lin, Z.; Kumar, T.; Chen, Xun; Lu, J.; Wizinowich, P.; Lilley, S.; Wetherall, E.; and McConell, N.; *Design of a Precision Calibration Unit for Keck NIRC2 AO Instrument*, 2020, SPIE, submitted
- [130] McConnell, N.; Barnes, A.; Skidmore, W.; Kupke, R.; Lu, J.; Roberts, S.; Bhatia, R.; Dawson, S.; Sanders, G.; Hunter, L.; *Inclusion in an international training program for early-career engineers and scientists in the Thirty Meter Telescope partnership*, 2020, SPIE, submitted
- [129] Ranka, T.; Chamarthi, S.; Surya, A.; Schoeck, M.; Lu, J.; *A New Software Tool to Predict Astrometric Errors for ELTs*, 2020, SPIE, submitted
- [128] Terry, S.K.; Bhattacharya, A.; Bennett, D.P.; Beaulieu, J.P.; Koshimoto, N.; Blackman, J.W.; Bond, I.A.; Cole, A.A.; Henderson, C.B.; Lu, J.R.; Baptiste Marquette, J.; Ranc, C.; Vandorou, A.; *MOA-2009-BLG-319Lb: A Sub-Saturn Planet Inside the Predicted Mass Desert*, submitted
- [127] Golovich, N.; Dawson, W. A.; Bartoli, F.; Lam, C.Y.; Lu, J.R.; Medford, M.S.; Schneider, M.D.; Chapline, G.; Schlafly, E.F.; Drlica-Wagner, A.; Pruett, K.; *A Reanalysis of Public Galactic Bulge Gravitational Microlensing Events from OGLE-III and IV*, submitted

- [126] Bhattacharya, A.; Bennett, D.P.; Beaulieu, J.P.; Bond, I.A.; Koshimoto, N.; Lu, J.R.; Blackman, J.W.; Vanderou, A.; Terry, S.K.; Batista, V.; Marquette, J.B.; Cole, A.A.; Fukui, A.; Henderson, C.B.; *MOA-2007-BLG-400 A Super-Jupiter Mass Planet Orbiting a Galactic Bulge K-dwarf Revealed by Keck Adaptive Optics Imaging*, submitted
- [125] Lai, O.; Chun, M.; Dungee, R.; Lu, J.; Carbillet, M.; *DO-CRIME: Dynamic On-sky Covariance Random Interaction Matrix Evaluation, a novel method for calibrating adaptive optics systems*, 2020, MNRAS, 3874
- [124] Hosek, M.W., Jr.; Lu, J.R.; Lam, C.Y.; Gautam, A.K.; Lockhart, K.E.; Kim, D.; Jia, S.; *SPiSEA: A Python-based Simple Stellar Population Synthesis Code for Star Clusters*, 2020, AJ, 160, 143
- [123] \*Medford, M.S.; Lu, J.R.; Dawson, W.A.; Lam, C.Y.; Golovich, N.R.; Schlafly, E.F.; Nugent, P.; *Gravitational Microlensing Event Statistics for the Zwicky Transient Facility*, 2020, ApJ, 897, 144
- [122] \*†Medford, M.S.; Lu, J.R.; Schlafly, E.F.; *Transformations from Pan-STARRS1 and UBV Filters into ZTF Filters*, 2020, RNAAS, 3, 38
- [121] Hees, A.; Do, T.; Roberts, B.M.; Ghez, A.M.; Nishiyama, S.; Bentley, R.O.; Gautam, A.K.; Jia, S.; Kara, T.; **Lu, J.R.**; Saida, H.; Sakai, S.; Takahashi, M.; Takamori, Y.; *Search for a variation of the fine-structure around the supermassive Black Hole in our Galactic Center*, 2020, PRL, 124, 081101
- [120] Bennett, D.P.; Bhattacharya, A.; Beaulieu, J.P.; Blackman, J.W.; Vanderou, A.; Terry, S.K.; Cole, A.A.; Henderson, C.B.; Koshimoto, N.; **Lu, J.R.**; Baptiste Marquette, J.; Ranc, C.; Udalski, A.; *Keck Observations Confirm a Super-Jupiter Planet Orbiting M-dwarf OGLE-2005-BLG-071L*, 2020, AJ, 159, 68
- [119] \*Lam, C.Y.; **Lu, J.R.**; Hosek Jr., M.W.; Dawson, W.A.; Golovich, N.R.; *PopSyCLE: A New Population Synthesis Code for Compact Object Microlensing Events*, 2020, ApJ, 889, 31
- [118] Wyrzykowski, L.; et al.; *Full orbital solution for the binary system in the northern Galactic disc microlensing event Gaia16aye*, 2020, A&A, 633, 98
- [117] The WFIRST Astrometry Working Group; Sanderson, R.E.; Bellini, A.; Casertano, S.; **Lu, J.R.**; Melchior, P.; Bennett, D.; Shao, M.; Rhodes, J.; Malhotra, S.; Gaudi, S.; Fall, M.; Nelan, E.; Guhathakurta, P.; Anderson, J.; Ho, S.; Libralato, M.; *Astrometry with the WFIRST Wide-Field Imager*, 2019, JATIS, 5(4), 044005 (arXiv:1712.05420)
- [116] Chen, Z.; Gallego-Cano, E.; Do, T.; Witzel, G.; Ghez, A.M.; Schoedel, R.; Sitarski, B.N.; Becklin, E.E.; **Lu, J.R.**; Morris, M.R.; Dehghanfar, A.; Gautam, A.K.; Hees, A.; Hosek Jr., M.W.; Jia, S.; Mangian, A.C.; Matthews, K.; *Consistency of the Infrared Variability of Sgr A\* Over 22 Years*, 2019, ApJL, 882, L28
- [115] †**Lu, J.R.**; et al.; *Training the Next Generation of OIR Instrumentalists*, 2019, Astro2020, APC White Paper, 277
- [114] †Bennett, D.; et al.; *Community Involvement in the WFIRST Exoplanet Microlensing Survey*, 2019, Astro2020, APC White Paper, 149
- [113] †Wright, S.; et al.; *Liger: Next Generation Imager and Spectrograph for Keck Observatory Adaptive Optics*, 2019, Astro2020, APC White Paper, 201
- [112] †Fitzgerald, M.; et al.; *The Planetary Systems Imager for TMT*, 2019, Astro2020, APC White Paper, 251
- [111] \*Service, M.; **Lu, J.R.**; Chun, M.; Suzuki, R.; Schoeck, M.; Atwood, J.; Andersen, D.; Herriot, G.; *Geometric Distortion Calibration with Photo-lithographic Pinhole Masks for High-Precision Astrometry*, 2019, JATIS, 5(3), 039005
- [110] Hees, A.; Dehghanfar, A.; Do, T.; Ghez, A.M.; Martinez, G.D.; Campbell, R.; **Lu, J.R.**; *An Adaptive Scheduling Tool to Optimize Measurements to Reach a Scientific Objective: Methodology and Application to the Measurements of Stellar Orbits in the Galactic Center*, 2019, ApJ, 880, 87

- [109] Do, T.; Hees, A.; Ghez, A.; Martinez, G.D.; Chu, D.S.; Jia, S.; Sakai, S.; **Lu, J.R.**; Gautam, A.K.; Kosmo O’Neil, K.; Becklin, E.E.; Morris, M.R.; Matthews, K.; Nishiyama, S.; Campbell, R.; Chen, Z.; Ciurlo, A.; Dehghanfar, A.; Gallego-Cano, E.; Kerzendorf, W.; Lyke, J.E.; Naoz, S.; Saida, H.; Schodel, R.; Takahashi, M.; Takamori, Y.; Witzel, G.; Wizinowich, P.; *Relativistic Redshift of the Star S0-2 Orbiting the Galactic Center Supermassive Black Hole*, 2019, *Science*, 365, 664
- [108] Kosmo O’Neil, K.; Martinez, G.D.; Hees, A.; Ghez, A.M.; Do, T.; Witzel, G.; Konopacky, Q.; Becklin, E.E.; Chu, D.S.; **Lu, J.R.**; Matthews, K.; Sakai, S.; *Improving Orbit Estimates for Incomplete Orbits with a New Approach to Priors – With Applications From Black Holes to Planets*, 2019, *AJ*, 158, 4
- [107] \*Rui, N.; Hosek Jr., M.W.; **Lu, J.R.**; Clarkson, W.I.; Anderson, J.; Morris, M.R.; Ghez, A.M.; *The Quintuplet Structure: Extended Structure and Tidal Radius*, 2019, *ApJ*, 877, 37
- [106] †Drlica-Wagner, A. et al.; *Probing the Fundamental Nature of Dark Matter with the Large Synoptic Survey Telescope*, 2019, LSST Dark Matter Group Report
- [105] †**Lu, J.R.**; Lam, C.Y.; Medford, M.; Dawson, W.; Golovich, N.; *Primordial Black Hole Microlensing: The Einstein Crossing Time Distribution*, 2019, *RNAAS*, 58
- [104] †**Lu, J.R.**; Lam, C.; Dawson, W.; Gaudi, B.S.; Golovich, N.; Medford, M.; Abdurrahman, F.; Beaton, R.L.; *Astro2020: From Stars to Compact Objects: The Initial-Final Mass Relation*, 2019, *Astro2020 Science White Paper*
- [103] †Hosek Jr., M.W.; **Lu, J.R.**; Andersen, M.; Do, T.; Kim, D.; Rui, N.Z.; Boyle, P.; Williams, B.F.; Chakrabarti, S.; Beaton, R.L.; *Star Formation in Different Environments: The Initial Mass Function*, 2019, *Astro2020 Science White Paper*
- [102] †Do, T.; Ghez, A.M.; **Lu, J.R.**; et al. *Envisioning the next decade of Galactic Center science: a laboratory for the study of the physics and astrophysics of supermassive black holes*, 2019, *Astro2020 Science White Paper*
- [101] †Greene, J.E.; et al.; *Astro2020 Science White Paper: The Local Relics of of Supermassive Black Hole Seeds*, 2019, *Astro2020 Science White Paper*
- [100] †Mazin, B.; et al.; *Directly Imaging Rocky Planets from the Ground*, 2019, *Astro2020 Science White Paper*
- [99] †Bechtol, K. et al.; *Astro2020: Dark Matter Science in the Era of LSST*, 2019, *Astro2020 Science White Paper*
- [98] †Bellini, A.; et al.; *Astro2020 Science White Paper: Science at the edges: internal kinematics of globular clusters’ external fields*, 2019, *Astro2020 Science White Paper*
- [97] †Gaudi, B.S.; et al.; *”Auxiliary” Science with the WFIRST Microlensing Survey*, 2019, *Astro2020 Science White Paper*
- [96] \*†Turri, P.; **Lu, J.R.**; *Testing AIROPA with a Defocus Wave-Front Error*, Keck Adaptive Optics Technical Note, 2019, 1267
- [95] Sakai, S.; **Lu, J.R.**; Ghez, A.M.; Jia, S.; Do, T.; Witzel, G.; Gautam, A.K.; Hees, A.; Morris, M.R.; Becklin, E.E.; Matthews, K.; Hosek Jr., M.W.; *The Galactic Center: An Improved Absolute Astrometric Reference Frame for Stellar Orbits around the Supermassive Black Hole*, 2019, *ApJ*, 873, 65
- [94] \*Jia, S.; **Lu, J.R.**; Sakai, S.; Gautam, A.K.; Do, T.; Hosek Jr., M.W.; Service, M.W.; Ghez, A.M.; Hees, A.; Schoedel, R.; Morris, M.R.; Becklin, E.E.; Matthews, K.; *The Galactic Center: Improved Relative Astrometry for Velocities, Accelerations, and Orbits Near the Supermassive Black Hole*, 2019, *ApJ*, 873, 9
- [93] \*Kim, D.; **Lu, J.R.**; Konopacky, Q.; Urban, L.; Toller, E.; Anderson, J.; Theissen, C.; Morris, M.R.; Becklin, E.E.; Ghez, A.M.; *Stellar Proper Motions in the Orion Nebular Cluster*, 2019, *AJ*, 157, 109K

- [92] \*Lockhart, K.E.; Do, T.; Larkin, J.E.; Boehle, A.; Campbell, R.; Chappell, S.; Chu, D.; Ciurlo, A.; Cosens, M.; Fitzgerald, M.; Ghez, A.M.; **Lu, J.R.**; Lyke, J.E.; Mieda, E.; Rudy, A.R.; Vayner, A.; Walth, G.; Wright, S.A.; *Characterizing and Improving the Data Reduction Pipeline for the Keck OSIRIS Integral Field Spectrograph*, 2019, AJ, 157, 75L
- [91] Gautam, A.K.; Do, T.; Ghez, A.M.; Morris, M.R.; Martinez, G.D.; Hosek Jr., M.W.; **Lu, J.R.**; Sakai, S.; Witzel, G.; Jia, S.; Becklin, E.E.; Matthews, K.; *An Adaptive Optics Survey of Stellar Variability at the Galactic Center*, 2018, ApJ, 871, 103G
- [90] \*Hosek Jr., M.W.; **Lu, J.R.**; Anderson, J.; Najarro, F.; Ghez, A.M.; Morris, M.R.; Clarkson, W.I.; Albers, S.; *The Unusual Initial Mass Function of the Arches Cluster*, 2018, ApJ, 870, 44H
- [89] Bhattacharya, A.; Beaulieu, J.P.; Bennett, D.P.; Anderson, J.; Koshimoto, N.; **Lu, J.R.**; Batista, V.; Blackman, J.W.; Bond, I.A.; Fukui, A.; Henderson, C.B.; Hirao, Y.; Marquette, J.B.; Mroz, P.; Ranc, C.; Udalski, A.; *WFIRST Exoplanet Mass-measurement Method Finds a Planetary Mass of  $39 \pm 8 M_{\text{earth}}$  for OGLE-2012-BLG-0950Lb*, 2018, AJ, 156, 289B
- [88] Koss, M.J.; Blecha, L.; Bernhard, P.; Hung, C.; **Lu, J.R.**; Trakthenbrot, B.; Treister, E.; Weigel, A.; Sartori, L.F.; Musotzky, R.; Schawinski, K.; Ricci, C.; Veilleux, S.; Sanders, D.B.; *A Population of Luminous Accreting Black Holes with Hidden Mergers*, 2018, Nature, 563, 214K
- [87] Chun, M.; **Lu, J.R.**; Lai, O.; Abdurrahman, F.; Service, M.; Toomey, D.; Fohring, D.; Baranec, C.; Hayano, Y.; Oya, S.; *On-Sky Results from the Wide-Field Ground-Layer Adaptive Optics Demonstrator, 'Imaka*, 2018, SPIE, 10703-0J
- [86] Do, T.; Ciurlo, A.; Witzel, G.; **Lu, J.R.**; Turri, P.; Fitzgerald, M.; Campbell, R.; Lyke, J.; Ghez, A.; *Point-Spread Function Reconstruction for Integral-Field Spectrograph Data*, 2018, SPIE, 10703-0I
- [85] \*Service, M.; Chun, M.; **Lu, J.R.**; Abdurrahman, F.; Lai, O.; Fohring, D.; Baranec, C.; *Geometric Distortion Calibration Using a Pinhole Mask*, 2018, SPIE, 10703-4S
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- [4] Kaspi, V.M.; Gavriil, F.P.; Chakrabarty, D.; **Lackey, J.R.**; Munro, M.P.; *Long-Term Rossi X-ray Timing Explorer Monitoring of the Anomalous X-ray Pulsar 1E 1048.1-5937*, 2001, ApJ, 558, 253
- [3] <sup>†</sup>**Lackey, J.R.**; *Monitoring Anomalous X-ray Pulsars with RXTE*, 2000, MIT Undergraduate Thesis
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- [1] Kaspi, V. M.; **Lackey, J.R.**; Mattox, J.; Manchester, R.N.; Bailes, M.; Pace, R.; *High-Energy Gamma-Ray Observations of Two Young, Energetic Radio Pulsars*, 2000, ApJ, 528, 445

TALKS AND  
POSTERS

**Summary:** 106 talks (68 invited, 9 public), 7 posters

Invited Talk: **OSU Colloquium**, remote 12/2020, *Searching for Black Holes in the Milky Way*

Invited Talk: **Keynote, Fifth Colombian Meeting on High Energy Physics**, remote 11/2020

Poster: **AAS 235**, Honolulu, HI 01/2020, *KAPA: A new Keck laser-guide star AO system that increases image quality and sky coverage*

Invited Talk: **AAS 235**, Honolulu, HI 01/2020, *The Science Case for the US ELT-P*

Invited Talk: **AAS 235**, Honolulu, HI 01/2020, *Understanding the Birth, Death, and Afterlife of Stars Using Astrometry*

Public Talk: **UC Berkeley Astronomy Roundtable**, UC Berkeley, CA 11/2019, *Hunting for Black Holes*

Talk: **Keck Science Meeting**, Los Angeles, CA 09/2019, *Hunting for the Invisible*

Invited Talk: **UC Berkeley Colloquium**, Berkeley, CA 09/2019, *Frontiers in Stellar Physics*

Invited Talk: **Texas A&M Colloquium**, College Station, TX 09/2019, *Hunting for Black Holes*

Public Talk: **Science at Cal**, UC Berkeley, CA 08/2019, *Black Holes, Big and Small - A Laser-Guided Adaptive Optics View*

Public Talk: **Lick Music of the Spheres**, Lick Observatory, Mt. Hamilton, CA 07/2019, *Black Holes, Big and Small - A Laser-Guided Adaptive Optics View*

Talk: **Science in Our Own Backyard**, Pasadena, CA 06/2019 *The Inner Milky Way with WFIRST*

Invited Talk: **Miller Symposium**, Marin County, CA 06/2019, *Black Holes, Big and Small - A Laser-Guided Adaptive Optics View*

Invited Talk: **UCSB Physics Colloquium**, Santa Barbara, CA 04/2019, *Black Holes, Big and Small - A Laser-Guided Adaptive Optics View*

Public Talk: **Prytanean Society Fellowship Lecture**, Berkeley, CA, 04/2019, *Hunting for Black Holes*

Invited Talk: **LCOGT Seminar**, Santa Barbara, CA, 04/2019, *Black Holes, Big and Small - A Laser-Guided Adaptive Optics View*

Talk: **Microlensing 22**, New York, NY, 02/2019, *Finding Stellar Mass Black Holes with Astrometric Microlensing*

Invited Talk: **WFIRST Science Investigation Team Meeting**, Burbank, CA, 12/2018, *WFIRST Beyond Dark Energy and Exoplanets*

Invited Talk: **SFSU Colloquium**, San Francisco, CA 12/2018, *Star Formation in Extreme Environments*

Invited Talk: **US ELT-Program Workshop**, Tucson, AZ, 11/2018, *TMT IRIS Overview*

Invited Talk: **Stars: Birth and Death**, GMT Conference, Hawaii, 09/2018, *Star Formation Differs in Extreme Environments*

Invited Talk: **Dunlap Summer School**, U Toronto, 07/2018, *Adaptive Optics*

Talk: **SPIE**, Austin, TX, 06/2018, *Ground Layer Adaptive Optics for the W. M. Keck Observatory: Feasibility Study*

Invited Talk: **Science with Precision Astrometry** Conference, STScI, Baltimore, MD, 03/2018, *Peering Deep into the Milky Way with Infrared Astrometry*

Invited Talk: **Multiplexed Fiber Spectroscopy with Keck & TMT** Conference, LBNL, Berkeley, CA, 01/2018, *Expanding the Adaptive Optics Field of View*

Invited Talk: **Cosmic Visions** Workshop, LBNL, Berkeley, CA, 11/2017, *Expanding the Adaptive Optics Field of View*

Talk: **CfAO Fall Retreat**, Lake Arrowhead, CA, 11/2017, *The AIROPA Software Package*, in collaboration with G. Witzel

Invited Talk: **U of Arizona** Colloquium, Tucson, AZ, 10/2017, *Black Holes, Big and Small: An Adaptive Optics View*

Talk: **Keck Time Domain Astronomy**, Santa Cruz, 09/2017, *Hunting for Black Holes with Astrometric Microlensing*

Invited Talk: **Keck Science Meeting**, Santa Cruz, 09/2017, *Keck GLAO Study*

Public Talk: **UC Berkeley**, 09/2017, *Hunting for Black Holes Using Laser-Guided Adaptive Optics*

Talk: **AO4ELT5** Conference, Tenerife, Spain 06/2017, *'imaka Wide-Field Ground Layer Adaptive Optics on Maunakea*

Invited Talk: **Lawrence Berkeley Labs** Seminar, Baltimore, MD 05/2017, *New Developments in Adaptive Optics: Wide Fields and Precise PSFs*

Invited Talk: **UC Berkeley** Colloquium, Baltimore, MD 03/2017, *Black Holes, Big and Small: An Adaptive Optics View*

Invited Talk: **UC Berkeley** Colloquium, Baltimore, MD 03/2017, *Black Holes, Big and Small: An Adaptive Optics View*

Invited Talk: **STScI** Colloquium, Baltimore, MD 02/2017, *Finding Stellar Mass Black Holes via Astrometric Microlensing*

Invited Talk: **Microlensing 21** Conference, Pasadena, CA 02/2017, *Finding Stellar Mass Black Holes via Astrometric Microlensing*

Talk: **AAS Meeting**, Dallas, TX 01/2017, *Finding Stellar Mass Black Holes via Astrometric Microlensing*

Talk: **Galactic Center Group** Workshop, Los Angeles, CA, 12/2016, *JWST on the Galactic Center*

Invited Talk: **Stellar Aggregates** Conference, Bad Honnef, Germany, 12/2016, *Review: The Milky Way's Central Molecular Zone and its Stellar Population*

Talk: **Berkeley Computational Imaging Lunch**, Berkeley, CA 11/2016, *Finding Stellar Mass Black Holes via Astrometric Microlensing*

Talk: **Berkeley Astronomy Lunch**, Berkeley, CA 09/2016, *Finding Stellar Mass Black Holes via Astrometric Microlensing*

Talk: **Keck Science Meeting**, Pasadena, CA, 09/2016, *Finding Free-Floating Black Holes via Astrometric Microlensing*

Invited Talk: **SPIE**, Edinburgh, Scotland, 06/2016, *Astrometry with Adaptive Optics*

Public Talk: **From Stars to Massive Stars**, Gainesville, FL, 04/2016 **The Heart of Our Milky Way: An Extreme Stellar Nursery Around a Black Hole**

Invited Talk: **From Stars to Massive Stars**, Gainesville, FL, 04/2016 **The IMF in Massive Young Clusters in the Milky Way Disk and Center**

Invited Talk: **Caltech** Colloquium, Pasadena, CA, 03/2016 **Stars in Motion**

Invited Talk: **UC Berkeley** Colloquium, Berkeley, CA, 02/2016 **Stars in Motion**

Invited Talk: **Dynamics and Accretion at the Galactic Center**, Aspen, CO, 02/2016, *The Dynamics and IMF of the Young Nuclear Star Cluster*

Talk: **AO4ELT4**, Lake Arrowhead, CA, 10/2015, *Search for Free-Floating Black Holes with Astrometric Microlensing*

Talk: **IAU General Assembly**, Honolulu, HI, 08/2015, *The Initial Mass Function in the Massive Young Cluster, Westerlund 1*

Public Talk: **Hawaiian Astronomical Society**, Honolulu, CA, 07/2015, *The Center of Our Milky Way: An Unusual and Extreme Stellar Nursery*

Invited Talk: **NRC-HIA** Colloquium, Victoria, Canada, 02/2015, *Star Formation in Extreme Environments*

Invited Talk: **Stanford** Colloquium, Palo Alto, CA, 11/2014, *Stars In Motion: Impact in Star Formation, Compact Objects, Galactic Centers*

Talk: **Center for Adaptive Optics Fall Retreat**, 11/2014, *Finding Free-Floating Black Holes with Astrometric Microlensing*

Invited Talk: **Kavli Frontiers of Science, Chinese-American Symposium**, Beijing, China, 10/2014, *The Center of Our Milky Way: An Unusual and Extreme Stellar Nursery*

Invited Talk: **Caltech GLAO Workshop**, Pasadena, CA, 09/2014, *GLAO Science: 'imaka and Beyond*

Talk: **Galactic and Extra-galactic Star Formation Conference**, Marseille, France, 09/2014, *The Initial Mass Function of Wd 1 from HST Astrometry and Photometry*

Invited Talk: **SPIE Conference**, Montreal, Canada, 06/2014, *Massive Clusters, the Galactic Center, and Astrometry*

Invited Talk: **Harvard-Smithsonian CfA**, Colloquium, Harvard, MA, 03/2014, *Star Formation in Extreme Environments*

Invited Talk: **UCSC**, Astronomy Colloquium, Santa Cruz, CA, 12/2013, *Young Stars in the Central Parsec of Our Galaxy*

Invited Talk: **The Orion Nebular Cluster Workshop**, STScI, Baltimore, MD, 10/2013, *Star Formation in Extreme Environments: Massive Clusters and the Galactic Center*

Invited Talk: **IAU303 Galactic Center Symposium**, Santa Fe, NM, 10/2013, *Young Stars in the Central Parsec of Our Galaxy*

Talk: **Adaptive Optics for Extremely Large Telescopes**, Florence, Italy, 5/2013, *Astrometry with the Gemini MCAO System*

Invited Talk: **UCLA** Astronomy Colloquium, Los Angeles, CA, 3/2013, *Star Formation in Extreme Environments: Massive Young Clusters and Galactic Centers*

Talk: **TMT Science and Instrumentation Workshop**, Pune, India, 12/2012, *Stars in Formation, In Motion*

Invited Talk: **MIT** Astronomy Colloquium, Boston, MA, 11/2012, *Star Formation in Extreme Environments near Supermassive Black Holes and in Massive Star Clusters*

Talk: **Center for Adaptive Optics Fall Retreat**, 10/2012, *Precision astrometry with Gemini's Multi-Conjugate Adaptive Optics System*

Invited Talk: **Univ. of Toronto** Astronomy Colloquium, Toronto, ON, 10/2012, *Star Formation in Extreme Environments near Supermassive Black Holes and in Massive Star Clusters*

Invited Talk: **STScI** Colloquium, Baltimore, MD, 10/2012, *Extremophiles: Stars Born around Black Holes and in Dense Clusters*

Public Talk: **Keck Astronomy Lecture Series**, Waimea, HI, 9/2012, *Stars Born in Extreme Environments*

Invited Talk: **UC Riverside** Astrophysics Seminar, Riverside, CA, 3/2012, *Star Formation in Extreme Environments*

Invited Talk: **UC San Diego** Astrophysics Seminar, San Diego, CA, 2/2012, *Star Formation in Extreme Environments*

Talk: **AAS Meeting**, Austin, TX, 1/2012, *Keck LGS-AO Observations of the Central 5 pc of M31*

Talk: **NSF AAPF Symposium**, Austin, TX, 1/2012, *Does Star Formation Differ Around the Supermassive Black Hole at the Galactic Center?*

Invited Talk: **IfA Star and Planet Formation Workshop**, Honolulu, HI, 12/2011, *The IMF in the Milky Way's Young Nuclear Star Cluster*

Invited Talk: **TMT Workshop**, Victoria, BC, 3/2011, *Astrometry with ELTs*

Invited Talk: **Univ. of Texas** Astronomy Colloquium, Austin, TX, 2/2011, *Clarifying our View of Milky Way Massive Young Star Clusters with Adaptive Optics*

Invited Talk: **Drexel University** Physics Colloquium, Philadelphia, PA, 1/2011, *Star Formation in Extreme Environments, Including Around the Milky Way's Supermassive Black Hole*

Invited Talk: **Institute for Astronomy, UHawaii** Astronomy Colloquium, Honolulu, HI, 1/2011, *Clarifying our View of Milky Way Massive Young Star Clusters with Adaptive Optics*

Talk: **AAS Meeting**, Seattle, WA 1/2011, *Clarifying our View of Milky Way Massive Young Star Clusters with Adaptive Optics*

Invited Talk: **Caltech** Astronomy Colloquium, Pasadena, CA, 12/2010, *Clarifying our View of Star Formation in Massive Young Clusters with Adaptive Optics*

Invited Talk: **Carnegie Observatories** Astronomy Colloquium, Pasadena, CA, 11/2010, *Clarifying our View of Star Formation in Massive Young Clusters with Adaptive Optics*

Invited Talk: **SPIE Conference**, San Deigo, CA, 6/2010, *Recent Results and Perspectives for Precision Astrometry and Photometry with Adaptive Optics*

Invited Talk: **UP 2010 Conference**, Sedona, AZ, 6/2010, *Clarifying our View of Star Formation in Massive Young Clusters and the Galactic Center with Adaptive Optics*

Invited Talk: **From Stars To Galaxies Conference**, U. of Florida, 4/2010, *Massive Young Star Clusters in Different Milky Way Environments*

Invited Talk: **Lawrence Livermore National Labs Colloquium**, 3/2010, *Clarifying our View of Star Formation in Massive Young Clusters with Adaptive Optics*

Invited Talk: **AAS Science with Adaptive Optics on Large Telescopes**, 6/2009, *Origin of Young Stars in the Galactic Center and M31*

Invited Talk: **AAS 2010-2020: The Decade of Astrometry**, 6/2009, *Relative Astrometry with Ground-Based Adaptive Optics Imaging*

Invited Talk: **UC Irvine Astrophysics Seminar**, 6/2009, *Origins of Young Stars Around the Two Closest Supermassive Black Holes*

Poster: **Intermediate-Mass Black Holes Conference**, UC Irvine, 4/2009, *Observational Constraints on Fueling the Starburst in the Central Parsec of M31*

Invited Talk: **Cal Poly Pomona Physics Colloquium**, 1/2009, *Star Formation Around the Supermassive Black Hole at the Center of our Galaxy*

Invited Talk: **U. of Florida, Gainseville Astronomy Colloquium**, 11/2008, *Young Stars in the Central Parsec of Our Galaxy*

Invited Talk: **Center for Adaptive Optics Fall Retreat**, 10/2008, *Characterizing and Improving Ground Based Astrometry from Keck*, joint talk with Sylvana Yelda

Public Talk: **Tarzana Medical Center Astronomy Symposium**, 08/2008, *Forming Stars Around the Supermassive Black Hole in Our Galaxy*

Invited Talk: **The Universe Under the Microscope Conference**, 04/2008, *Dynamics of the Stars Around Our Galaxy's Supermassive Black Hole*

Talk: **AAS Meeting**, 01/2008, *Orbits and Origins of Young Stars in the Central Parsec of the Milky Way*

Invited Talk: **Keck Science Meeting**, 09/2007, *Astrometry with the Next Generation Adaptive Optics System at Keck*, joint talk with Brian Cameron

Poster: **Science in the Era of TMT Conference**, 07/2007, *A Magnified View of the Nucleus of M31 with TMT*

Invited Talk: **Galactic Center Workshop**, Ringberg, 06/2007, *Young Stellar Disks in the Galactic Center*

Invited Talk: **Center for Adaptive Optics Spring Retreat**, 03/2007, *Astrometry with Adaptive Optics Imaging*

Invited Talk: **UC Berkeley**, Theoretical Astrophysics Center Seminar, 10/2006, *The Galactic Center: Star Formation Near a Supermassive Black Hole?*

Talk: **Keck Science Meeting**, 09/2006, *Orbits and Origins of the Young Stars at the Center of Our Milky Way Galaxy*

Talk: **Galactic Center Workshop**, 04/2006, *Galactic Center Youth: Orbits and Origins of the Young Stars in the Central Parsec*

Invited Talk: **USC Viterbi School of Engineering** Undergraduate Honors Colloquium, 04/2006, *The Supermassive Black Hole at the Center of the Milky Way*

Talk: **AAS Meeting**, 01/2006, *Orbits and Origins of the Young Stars at the Center of Our Milky Way Galaxy*

Talk: **Center for Adaptive Optics NSF Site Visit**, 11/2005, *Overview of UCLA Galactic Center Research with Keck*

Talk: **Center for Adaptive Optics Fall Retreat**, 10/2005, *Overview of UCLA Galactic Center Research with Keck*

Poster: **KITP Galactic Center Conference**, 04/2005, *IRS 16 SW - A New Comoving Group of Young Stars in the Central Parsec of Our Galaxy*

Poster: **AAS Meeting**, 01/2005, *IRS 16 SW - A New Cluster of Young Stars in the Central Parsec of Our Galaxy*

Poster: **Center for Adaptive Optics Fall Retreat**, 10/2004, *IRS 16 SW - A New Comoving Group of Young Stars in the Central Parsec of Our Galaxy*