

# Curriculum Vitae: James E. Lyke

## Personal Information

Work Address: W. M. Keck Observatory, 65-1120 Mamalahoa Hwy, Kamuela, HI USA 96743  
Home Address: *please contact me for unredacted version*  
Email: [jlyke@keck.hawaii.edu](mailto:jlyke@keck.hawaii.edu)  
Telephone: *please contact me for unredacted version*  
Date of Birth: *please contact me for unredacted version*  
Nationality: US  
Marital Status: *please contact me for unredacted version*

## Employment

Mar 2024 – Present Manager of Observing Support, W. M. Keck Observatory, Kamuela, HI, USA  
Aug 2021 – Mar 2024 Adaptive Optics Science Operations Lead, W. M. Keck Observatory, Kamuela, HI, USA  
Dec 2016 – Aug 2021 Adaptive Optics Operations Lead Scientist, W. M. Keck Observatory, Kamuela, HI, USA  
Sept 2003 – Dec 2016 Support Astronomer, W. M. Keck Observatory, Kamuela, HI, USA  
Aug 2002 – Aug 2003 Doctoral Dissertation Fellow, University of Minnesota, Minneapolis, MN, USA  
Jan 1998 – Aug 2003 Graduate Research Assistant, University of Minnesota, Minneapolis, MN, USA

## Education

2003 PhD in Astrophysics at the University of Minnesota, Minneapolis, MN, USA  
Advisors: R. D. Gehrz and C. E. Woodward  
1997 B.S. Astrophysics, Summa Cum Laude, University of Minnesota, Minneapolis, MN, USA  
1997 B.S. Physics, Summa Cum Laude, University of Minnesota, Minneapolis, MN, USA

## Professional Roles (W.M. Keck Observatory)

**Manager of Observing Support:** Supervise a team of 10 astronomers who ensure that two, world-class, 10-meter telescopes, their instruments, and AO systems are ready to produce the best science every night.

**AO Science Operations Lead:** Direct a multi-disciplinary team to ensure two, world-class, laser- and natural guide star AO systems are fully functional for science operations. Maintain a labor and procurement budget of about \$1M, interface with development teams to maintain the state of the art via AO upgrades, supervise the AO Operations Scientist, and develop the AO skills of the science operations staff.

**AO Ops Lead Scientist:** Direct a multi-disciplinary team to ensure two, world-class, laser- and natural guide star AO systems are fully functional for science operations. Maintain a labor and procurement budget of more than \$500K, interface with development teams to maintain the state of the art via AO upgrades.

**Support/Staff Astronomer:** Point of contact for visiting observers. Expert in planning, calibration, execution, and data reduction of observations for optical and IR instruments.

**Instrument Master/Scientist:** Responsible for all cryogenic, electronic, mechanical, optical, software, and vacuum aspects of facility instruments. Local lead for upgrades to instruments

2006-2022: OSIRIS, AO-fed IR Integral Field Spectrograph and Imager

2014-Present: ESI, Optical Medium/High Resolution Cross-Dispersed Echelle Spectrograph

2017-Present: PCS, Engineering cameras for phasing the primary mirror

- 2004-2012: NIRSPEC, IR High Resolution Cross-Dispersed Echelle Spectrograph
- Secondary Instrument Master/Scientist**
- 2022-Present: OSIRIS
- 2008-Present: Mainland Observing
- 2012-Present: NIRSPEC
- 2015-Present: MOSFIRE, IR Multi-Object Spectrograph
- 2009-2016,  
2024-Present: Laser- and Natural-Guide Star Adaptive Optics
- 2008-2014: ESI
- 2005-2012: DEIMOS, Optical Multi-Object Spectrograph
- 2016-2018: **Local Project Manager, OSIRIS Imager Detector Upgrade**  
Responsible for ~\$1.8M GBMF-funded work
- 2016-2017: **Local Project Manager, OSIRIS Spectrograph Detector Upgrade**  
Responsible for ~\$1M NSF-funded work
- 2015-2017: **Project Scientist, Keck Telescope Control System Upgrade**  
Maintain scientific requirements  
Work closely with team to ensure implementation of scientific requirements  
Develop and execute on-sky tests for 8 facility- and 4 engineering-instruments  
Liaise with operations teams to verify operational requirements and identify and fix any issues
- 2016-Present: Chair, **Adaptive Optics Change Control Board**  
Review proposed changes to the AO systems to ensure continued science production
- 2013-2017: Chair, **Engineering Time Allocation Committee**  
Determine engineering needs for operations and projects and produce schedule  
Resolve issues to ensure sky time is used wisely and efficiently
- 2009-2010: **Operations Concepts Team, Next Generation Adaptive Optics (NGAO) project**  
Develop Functional Requirements of Observing Tools and Sequences  
Develop Observing Operations Concepts Document  
Develop On-sky I&T and Science Verification plans
- 2004-2007: **Internal Project Scientist, MAGIQ (guider) project**  
Develop Project Requirements  
Conduct Camera Trade Study

### Professional Experiences (W.M. Keck Observatory)

- 2003-Present: >1400 nights direct observing support covering nearly all Keck facility instruments  
Instrument Repair-, Upgrade-, and Service-Lead
- 2020: OSIRIS – Upgrade holographic aperture mask (HAM)
- 2017: OSIRIS – Upgrade Imager (H1+SDSU to H2RG+ASIC)
- 2016: OSIRIS – Upgrade Spectrograph Detector (H2+SDSU to H2RG+ASIC)
- 2013: OSIRIS – Upgrade grating and replace cold head
- 2012: OSIRIS – Move instrument from K2 to K1 and recommission
- 2012: NIRSPEC – Replace aging cold heads
- 2009: OSIRIS – Replace failed cold head
- 2009: NIRSPEC – Install new AO pupil
- 2008: OSIRIS – Install new SPEC filters
- 2008: NIRSPEC – Install new guider camera system
- 2006: OSIRIS – Repair internal support structure after M6.7 earthquake
- 2004: NIRSPEC – Repair broken cryogenic filter wheel
- 2004-2012: NIRSPEC – Replace/service dewar window annually

## Adaptive Optics Projects, Lead or Assist Transition to Operations

2021:	K1 – KAPA + RTC upgrade
2019:	K1 – TOPTICA laser
2016:	K2 – TOPTICA laser
2015:	K2 – LGS center launch system
2013-2019:	K1 – IR TT sensor (TRICK)
2010-2012:	K1 – Add LGS
2007:	K2 – Next Generation Wavefront Controller
2006:	K1 – Next Generation Wavefront Controller
2003-2005:	K2 – LGS science operations

## Professional Service

Scientific Publication Referee: MNRAS, ApJ

Liaison: SAE G10T Laser Safety Hazards Committee

## Language

English: Native

## Computer Skills

### Development

Configuration management (git, SVN, CVS), Methodologies (Agile, DevOps, Waterfall)

### Languages

Expert: IDL, shell scripting, HTML

Intermediate: Python, C, IRAF, PHP, perl, Java, Javascript, LaTeX

### Operating Systems

Unix/Linux, MacOS, Windows

### Applications

Office, Google Drive, Atlassian (Confluence, Jira), Slack, Zoom

## Refereed Publications

1. "Formation of CN and CO Molecules in the Envelope of Nova V1391 Cas During the Near-maximum Phase", Kawakita, H. and **Lyke, J.E.**, 2024, AJ, 168, 266.
2. "W. M. Keck observatory instrumentation status and future direction", Kassis, M., Allen, S.L., et al. (including **Lyke, J.E.**), 2023, Astronomische Nachrichten, 344, e20230088.
3. "AIROPA II: modeling instrumental aberrations for off-axis point spread functions in adaptive optics", Ciulo, A., Turri, P., et al. (including **Lyke, J.E.**), 2022, JATIS, 8, 038007.
4. "Using Non-negative Matrix Factorization to Improve Calibration of the Keck OSIRIS Integral Field Spectrograph", Horstman, K., Fitzgerald, M.P., et al. (including **Lyke, J.E.**), 2022, PASP, 134, 064504.
5. "Optical and near-infrared data and modelling of nova V5668 Sgr", Takeda, L., Diaz, M., et al., (including **Lyke, J.E.**), MNRAS, 511, 1591.
6. "Analyzing long-term performance of the Keck-II adaptive optics system", Ramey, E., Lu, J.R., et al. (including **Lyke, J.E.**), JATIS, 8, 028004.
7. "First light of a holographic aperture mask: Observation at the Keck OSIRIS Imager", Doelman, D.S., Wardenier, J.P., Tuthill, P., et al. (including **Lyke, J.E.**), 2021, A&A, 649, 168.
8. "Two close binaries across the hydrogen-burning limit in the Praesepe open cluster", Lodieu, N., del Burgo, C., Manjavacas, E., et al. (including **Lyke, J.E.**), 2020, MNRAS, 498, 3964.
9. "Relativistic redshift of the star S0-2 orbiting the Galactic Center supermassive black hole", Do, T., Hees, A., Ghez, A., et al. (including **Lyke, J.E.**), 2019, Science, 365, 664.

10. "Characterizing and Improving the Data Reduction Pipeline for the Keck OSIRIS Integral Field Spectrograph", Lockhart, K.E., Do, T., Larkin, J.E., et al. (including **Lyke, J.E.**), 2019, *AJ*, 157, 75.
11. "A potential progenitor for the Type Ic supernova 2017ein", Kilpatrick, C.D., Takaro, T., Foley, R.J., et al. (including **Lyke, J.E.**), 2018, *MNRAS*, 480, 2072.
12. "3D photoionization models of nova V723 Cas", Takeda, L., Diaz, M., Campbell, R., and **Lyke, J.E.**, 2018, *MNRAS*, 473, 355.
13. "Measuring temperature and ammonia hydrate ice on Charon in 2015 from Keck/OSIRIS spectra", Holler, B.J., Young, L.A., Buie, M.W., et al. (including **Lyke, J.E.**), 2017, *Icarus*, 284, 394.
14. "The Team Keck Redshift Survey 2: MOSFIRE Spectroscopy of the GOODS-North Field", Wirth, G.D., Trump, J.R., Barro, G., et al. (including **Lyke, J.E.**), 2015, *AJ*, 150, 153.
15. "Keck-I MOSFIRE Spectroscopy of Compact Star-forming Galaxies at  $z > 2$ : High Velocity Dispersions in Progenitors of Compact Quiescent Galaxies", Barro, G., Trump, J.R., Koo, D.C., et al. (including **Lyke, J.E.**), 2014, *ApJ*, 795, 145.
16. "Efficiency Measurements and Installation of a New Grating for the OSIRIS Spectrograph at Keck Observatory", Mieda, E., Wright, S.A., Larkin, J.E., et al. (including **Lyke, J.E.**), 2014, *PASP*, 126, 250.
17. "Phase-resolved Infrared Spectroscopy and Photometry of V1500 Cygni, and a Search for Similar Old Classical Novae", Harrison, T.E., Campbell, R.D., and **Lyke, J.E.**, 2013, *AJ*, 146, 37.
18. "The Low-Mass Companion to the Lithium-Depleted, Spectroscopic Binary HBC 425 (St 34)", Dahm, S.E. and **Lyke, J.E.**, 2011, *PASP*, 123, 1383.
19. "Indecent Exposure in Seyfert 2 Galaxies: A Close Look", Tran, H.D., **Lyke, J.E.**, and Mader, J.A., 2011, *ApJ*, 726L, 21.
20. "The peculiar dust shell of Nova DZ Cru (2003)", Evans, A., Gehrz, R.D., Woodward, C.E., et al. (including **Lyke, J.E.**), 2010, *MNRAS*, 406L, 85.
21. "The Distance and Morphology of V723 Cassiopeiae (Nova Cassiopeia 1995)", **Lyke, J.E.**, and Campbell, R.D., 2009, *AJ*, 138, 1090.
22. "Nova V2362 Cygni (nova Cygni 2006): Spitzer, Swift, and Ground-Based Spectral Evolution", Lynch, D.K., Woodward, C.E., Gehrz, R.D., et al. (including **Lyke, J.E.**), 2008, *AJ*, 136, 1815.
23. "The Early Spectrophotometric Evolution of V1186 Scorpii (Nova Scorpii 2004 No. 1)", Schwarz, G.J., Woodward, C.E., Bode, M.F., et al. (including **Lyke, J.E.**), 2007, *AJ*, 134, 516.
24. "The Wide Brown Dwarf Binary Oph 1622-2405 and Discovery of a Wide, Low-Mass Binary in Ophiuchus (Oph 1623-2402): A New Class of Young Evaporating Wide Binaries?", Close, L.M., Zuckerman, B., Song, I., et al. (including **Lyke, J.E.**), 2007, *ApJ*, 660, 1492.
25. "Temporal evolution of parent volatiles and dust in Comet 9P/Tempel 1 resulting from the Deep Impact experiment", DiSanti, M.A., Villanueva, G.L., Bonev, B., et al. (including **Lyke, J.E.**), 2007, *Icar*, 187, 240.
26. "Early Infrared Spectral Development of V1187 Scorpii (Nova Scorpii 2004 No. 2)", Lynch, D.K., Woodward, C.E., Geballe, T.R., et al. (including **Lyke, J.E.**), 2006, *ApJ*, 638, 987.
27. "Parent Volatiles in Comet 9P/Tempel 1: Before and After Impact", Mumma, M.J., DiSanti, M.A., Magee-Sauer, K., et al. (including **Lyke, J.E.**), 2005, *Sci*, 310, 270.
28. "Deep Impact: Observations from a Worldwide Earth-Based Campaign", Meech, K.J., Ageorges, N., A'Hearn, M.F., et al. (including **Lyke, J.E.**), 2005, *Sci*, 310, 265.
29. "The Development of a Steady State, Asymptotic Giant Branch Type, Circumstellar Wind around the 'Born Again' Star FG Sagittae", Gehrz, R.D., Woodward, C.E., Temim, T., et al. (including **Lyke, J.E.**), 2005, *ApJ*, 623, 1105.
30. "The Team Keck Treasury Redshift Survey of the GOODS-North Field", Wirth, G.D., Willmer, C.N.A., Amico, P., et al. (including **Lyke, J.E.**), 2004, *AJ*, 127, 3121.

31. "Infrared Space Observatory and Ground-Based Infrared Observations of the Classical Nova V723 Cassiopeiae", Evans, A., Gehrz, R.D., Geballe, T.R., et al. (including **Lyke, J.E.**), 2003, *AJ*, 126, 1981.
32. "Abundance Anomalies in CP Crucis (Nova Crux 1996)", **Lyke, J.E.**, Koenig, X.P., Barlow, M.J., et al., 2003, *AJ*, 126, 993.
33. "Infrared Space Observatory Short Wavelength Spectrometer Observations of V1425 Aquilae (Nova Aquila 1995)", **Lyke, J.E.**, Gehrz, R.D., Woodward, C.E., et al., 2001, *AJ*, 122, 3305.