

Dr. Albert R. Conrad

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EMPLOYMENT HISTORY

2011 – Present Max Planck Institute for Astronomy, Heidelberg, Germany
System Lead for the LINC-NIRVANA Adaptive Optics
2003 – 2010 W.M. Keck Observatory, Kamuela, Hawaii
Support Astronomer
1998 - 2003 W.M. Keck Observatory, Kamuela, Hawaii
Manager of the Telescope and Instrumentation Software Development Group
1992 - 1997 W.M. Keck Observatory, Kamuela, Hawaii
Instrument Software Engineer

EDUCATION

1994 University of California at Santa Cruz
Doctor of Philosophy in Computer and Information Science
Dissertation: Exact Arithmetic in Q with Applications in Celestial Mechanics

Chair: Ira Pohl, Computer Science

Committee: Al Kelley, Mathematics

Charlie McDowell, Computer Science

1977 University of California at Berkeley
Master of Science in Electrical Engineering and Computer Science

1975 University of California at Berkeley
Bachelor of Science in Mathematics and Computer Science

PROFESSIONAL ACTIVITIES, HONORS, & AWARDS

Member of the International Astrophysical Union Working Group on Cartographic Coordinates and Rotational Elements (IAU/WGCCRE).

Co-Investigator of NASA Planetary Astronomy Grant '*Disk-Resolved Imaging of Asteroids.*'

Commendation from W. M. Keck Director for accomplishments in astronomical research.

Commendation from W. M. Keck Director for excellence in software group management.

Graduated with Great Distinction in Mathematics from U. C. Berkeley.

PUBLICATION RECORD

Refereed Journals

1. Merline, W. J.; Drummond, J. D.; Carry, B.; **Conrad, A.**; Tamblyn, P. M.; Dumas, C.; Kaasalainen, M.; Erikson, A.; Mottola, S.; Durech, J.; Rousseau, G.; Behrend, R.; Casalnuovo, G. B.; Chinaglia, B.; Christou, J. C.; Chapman, C. R.; Neyman, C. "The Resolved Asteroid Program - Size, shape, and pole of (52) Europa", *Icarus* arXiv:1301.5101 (2013)
2. Zhang X., Arcidiacono C, **Conrad A.R.**, Herbst T.M., Gaessler W., Bertram T., Ragazzoni R., Schreiber L., Diolaiti E., Kuerster M., Bizenberger P., Meschke D., Rix H.W., Rao C., Mohr L., Briegel F., Kittmann F., Berwein J., Trowitzsch J. "Calibrating the interaction matrix for the LINC-NIRVANA high layer wavefront sensor" *Optics Express* **20** 8078 (2012)
3. B. Carry, M. Kaasalainen, W. J. Merline, T. G. Mueller, L. Jorda, J. D. Drummond, J. Berthier, L. O'Rourke, J. Durech, M. Kueppers, **A. Conrad**, C. Dumas, H. Sierks, and the OSIRIS Team "Shape modeling technique KOALA validated by ESA Rosetta at (21) Lutetia" *Planetary and Space Science* **66** 200 (2012)
4. Archinal, B. A.; A'Hearn, M. F.; **Conrad, A.**; Consolmagno, G. J.; Courtin, R.; Fukushima, T.; Hestroffer, D.; Hilton, J. L.; Krasinsky, G. A.; Neumann, G.; et al. "Erratum to: Reports of the IAU Working Group on Cartographic Coordinates and Rotational Elements: 2006 & 2009" *Celestial Mechanics & Dynamical Astronomy* **110** 401 (2011) 110
5. Xianyu Zhang, Wolfgang Gaessler, **Albert R. Conrad**, Thomas Bertram, Carmelo Arcidiacono, Thomas M. Herbst, Martin Kuerster, Peter Bizenberger, Daniel Meschke, Hans-Walter Rix, Changhui Rao, Lars Mohr, Florian Briegel, Frank Kittmann, Juergen Berwein, Jan Trowitzsch, Laura Schreiber, Roberto Ragazzoni, Emiliano Diolaiti "First laboratory results with the LINC-NIRVANA high layer wavefront sensor" *Optics Express* **19** 16087 (2011)
6. J.L. Heldmann, et al., "LCROSS (Lunar Crater Observation and Sensing Satellite) Observation Campaign: Strategies, Implementation, and Lessons Learned", *Space Science Reviews* **167** 93 (2012)
7. Imke de Pater, Michael H. Wong, Katherine de Kleer, Heidi B. Hammel, Mate Adamkovics, **Al Conrad** "Keck Adaptive Optics Images of Jupiter's North Polar Cap and Northern Red Oval", *Icarus* **213** 559 (2011)
8. B.A. Archinal (chair), M.F. A'Hearn, E. Bowell, **A. Conrad**, G.J. Consolmagno, R. Courtin, T. Fukushima, D. Hestroffer, J.L. Hilton, G.A. Krasinsky, G. Neumann, J. Oberst, P.K. Seidelmann, P. Stooke, D.J. Tholen, P.C. Thomas, I.P. Williams "Report of the IAU/IAG Working Group on Cartographic Coordinates and Rotational Elements: 2009" *Celestial Mechanics & Dynamical Astronomy* **109**, 101 (2011)
9. J.D. Drummond, **A. Conrad**, W. J. Merline, B. Carry, C. R. Chapman, H. A. Weaver, P. M. Tamblyn, J. C. Christou, C. Dumas "Physical properties of the ESA Rosetta target asteroid (21) Lutetia. I. The triaxial ellipsoid dimensions, rotational pole, and bulk density", *Astronomy and Astrophysics* **523** A93 (2010)
10. Carry B., Kaasalainen M., Leyrat C., Merline W. J., Drummond J. D., **Conrad A.**, Weaver H. A., Tamblyn P. M., Chapman C. R., Dumas C., Colas F., Christou J. C., Dotto E., Perna D., Fornasier S., Bernasconi L., Behrend R., Vachier F., Kryszczyńska A., Polinska M., Fulchignoni M.,

- Roy R., Naves R., Poncy R., Wiggins P. "Physical properties of the ESA Rosetta target asteroid (21) Lutetia : II. Shape and flyby geometry, *Astronomy and Astrophysics*", **523**, A94 (2010)
11. Imke de Pater, Michael H. Wong, Philip Marcus, Stacia Luszcz-Cook, Mate Adamkovics, **Al Conrad**, Xylar Asay-Davis, Christopher Go "Persistent Rings in and around Jupiter's Anticyclones - Observations and Theory", *Icarus* **210** 742 (2010)
 12. Benoit Carry, Christophe Dumas, Mikko Kaasalainen, Jérôme Berthier, William J Merline, Stéphane Erard, **Al Conrad**, Jack D Drummond, Daniel Hestroffer, Marcello Fulchignoni, Thierry Fusco "Physical Properties of 2 Pallas", *Icarus* **205** 460 (2010)
 13. **A. R. Conrad**, R. W. Goodrich, R. D. Campbell, W. J. Merline, J. D. Drummond, C. Dumas, B. Carry "Keck observations of Solar System objects: Perspectives for ELT", *Earth Moon and Planets* **105** 115 (2009)
 14. Michael W. Busch, Shrinivas R. Kulkarni, **Al Conrad** "No Satellites Detected Around 21 Lutetia", *Icarus* **203** 681 (2009)
 15. **A.R. Conrad**, C. Dumas, W. J. Merline, J.D. Drummond, R.D. Campbell, R. W. Goodrich, D. Le Mignant, F. H. Chaffee, T. Fuscoe, S.H. Kwok and R. I. Knight, "Direct measurement of the size, shape, and pole of 511 Davida with Keck AO in a single night," *Icarus*, Vol. 191, pp. 616-627, 2007.
 16. Michael W. Busch, Shrinivas R. Kulkarni, **A.R. Conrad**, P. Brian Cameron, "Keck Adaptive Optics Imaging of Near-Earth Asteroid 2004 XP14," *Icarus*, Vol. 192, pp. 589-590, 2007.
 17. P.K. Seidelmann, B.A. Archinal, M.F. A'Hearn, **A. Conrad**, G.J. Consolmagno, D. Hestroffer, J.L. Hilton, G.A. Krasinsky, G. Neumann, J. Oberst, P. Stooke, E.F. Tedesco, D.J. Tholen, P.C. Thomas, I.P. Williams, "Report of the IAU/IAG Working Group on Cartographic Coordinates and Rotational Elements," *Celestial Mechanics & Dynamical Astronomy*, Vol. 98, pp. 155-180, 2007.
 18. Close, Laird M., Zuckerman, Ben, Song, Inseok, Barman, Travis, Marois, Christian, Rice, Emily L., Siegler, Nick, Macintosh, Bruce, Becklin, Eric E., Campbell, Randy, Lyke, James E., **Conrad, Al**, Le Mignant, David, "New Masses and Ages for the Planetary Mass Binary Candidate Ophiuchus #11 and the Discovery of Another Very Wide, Low-Mass, Binary in Ophiuchus," *The Astrophysical Journal*, Vol. 660, pp. 1492-1506, 2007.
 19. M. E. Brown, M. A. van Dam, A. H. Bouchez, D. Le Mignant, R. D. Campbell, J. C. Y. Chin, **A. Conrad**, S. K. Hartman, E. M. Johansson, R. E. Lafon, D. L. Rabinowitz, P. J. Stomski, Jr., D. M. Summers, C. A. Trujillo, and P. L. Wizinowich, "Satellites of the largest Kuiper Belt objects," *The Astrophysical Journal*, 639, pp. L43-L46, 2006.
 20. F. Marchis, D. Le Mignant, F.H. Chaffee, A.G. Davies, S.H. Kwok, R. Prange, I. dePater, P. Amico, R. Campbell, T. Fuxco, R.W. Goodrich, **A. Conrad**, "Keck AO survey of Io global volcanic activity between 2 and 5 um," *Icarus*, Vol. 176, pp. 96-122, 2005.
 21. Michael J. Mumma, Michael A. DiSanti, Karen Magee-Sauer, Boncho P. Bonev1, Geronimo L. Villanueva1, Hideyo Kawakita, Neil Dello Russo,

- Erika L. Gibb, James E. Lyke, Randall D. Campbell, Joel Ayccock, **Al Conrad**, Grant M. Hill, "Direct Measurement of Parent Volatiles in comet 9P/Tempel 1: A comparison of volatile composition before and after Impact," *Science*, No. 14, pp. 270-274, 2005.
22. Meech, K. J., et al., "Deep Impact: Observations from a Worldwide Earth-Based Campaign Science," Vol. 310, pp. 265-269, 2005.
 23. Wirth, Gregory D., et al., "The Team Keck Treasury Redshift Survey of the GOODS-North Field," *The Astrophysical Journal*, Vol. 127, pp. 3121-3136, 2004.
 24. Mumma, M. J., McLean, I. S., DiSanti, M. A., Larkin, J. E., Dello Russo, N., Magee-Sauer, K., Becklin, E. E., Bida, T., Chaffee, F., **Conrad, A. R.**, and 9 others, "A survey of organic volatile species in comet C/1999 H1 (Lee) using NIRSPEC at the Keck Observatory," *The Astrophysical Journal*, Vol. 546, pp. 1183-1193, 2001.

International Astrophysical Union (IAU) Circulars

1. W. J. Merline; P. M. Tamblyn; B. D. Warner; P. Pravec; J. P. Tamblyn; C. Neyman; **A. R. Conrad**; W. M. Owen; B. Carry; J. D. Drummond; et al., "S/2012 (2577) 1", 3765 (2013)
2. Merline, W. J.; Drummond, J. D.; Tamblyn, P. M.; Carry, B.; Neyman, C.; **Conrad, A. R.**; Chapman, C. R.; Christou, J. C.; Dumas, C.; Enke, B. L., "2005 YU_55," *IAU Circular*, No. 9242 (2011)
3. Merline, W. J.; Tamblyn, P. M.; Drummond, J. D.; Christou, J. C.; **Conrad, A. R.**; Keck Observatory, W. M.; Carry, B.; Chapman, C. R.; Dumas, C.; Durda, D. D.; "S/2009 (317) 1", *IAU Circular*, No. 9099 (2010)
4. W. J. Merline, **A. R. Conrad**, J. D. Drummond, P. M. Tamblyn, C. Dumas, B. Carry, R.M. Owen, R.D., Campbell, R.W. Goodrich, "S/2008 35107," *IAU Circular*, No. 8977, September 18, 2008.
5. **A. R. Conrad**, W. J. Merline, J. D. Drummond, P. M. Tamblyn, C. Dumas, B. Carry, R.D., Campbell, R.W. Goodrich, R.M. Owen, C. R. Chapman, "S/2008 41," *IAU Circular*, No. 8930, March 21, 2008.
6. Merline, W. J., Dumas, C., Siegler, N., Close, L. M., Chapman, C. R., Tamblyn, P. M., Terrell, D., **Conrad, A.**, Menard, F., Duvert, G., "S/2003 283," *IAU Circular*, No. 8165.
7. Mumma, M. J., Dello Russo, N., DiSanti, M. A., Magee-Sauer, K., Novak, R., **Conrad, A.**, Chaffee, F., "Comet C/1999 T1 (McNaught-Hartley)," *IAU Circular*, No. 7578, 2000.

Magazine Articles and Books Published

1. **Albert R. Conrad**, "Software Systems for Astronomy," *Springer-Link Briefs*, in press, 2013
2. Laura Kinoshita, **Al Conrad**, Bill Merline, "Discovery of an Extreme Asteroid Moon," *Cosmic Matters Magazine*, Summer 2008.
3. Mike Brown, **Al Conrad**, Linda Copman, "Planetary Astronomy: The New Solar System," *Cosmic Matters Magazine*, Fall 2007.
4. Robert Kibrick, **Al Conrad**, Andrew Perala, "Through the far looking glass: collaborative remote observing with the W. M. Keck

Observatory," *ACM Interactions*, Vol, 5, Iss. 3, pp. 32 – 39, ISSN:1072-5520, 1998

Papers Presented at Astronomy Conferences (AAS/DPS, LPSC, ACM/LPI¹)

1. **Conrad, A. R.**; Merline, W. J.; La Camera, A.; Boccacci, P.; Bertero, M.; Herbst, T. M.; Kuerster, M.; Carry, B.; Drummond, J.; Norris, M.; Christou, J. C. "Detecting Asteroid Satellites with LINC-NIRVANA at the Large Binocular Telescope", *LPSC* **1719** 2032 (2013)
2. Merline, William J.; Weaver, H. A.; Tamblyn, P. M.; Neyman, C.; Stern, S. A.; Carry, B.; Spencer, J. R.; **Conrad, A. R.**; Showalter, M. A.; Olkin, C. B. "A Keck Search for Faint Satellites of Pluto in Support of New Horizons", *AAS/DPS* **44** 304.09 (2012)
3. Drummond, Jack D.; Merline, W. J.; **Conrad, A.**; Dumas, C.; Tamblyn, P.; Christou, J.; Carry, B.; Chapman, C. "The Triaxial Ellipsoid Diameters and Rotational Pole of Asteroid (9) Metis from AO at Gemini and Keck", *AAS/DPS* **44** 302.09 (2012)
4. Merline, W. J.; Drummond, J. D.; Tamblyn, P. M.; Neyman, C.; Carry, B.; **Conrad, A. R.**; Chapman, C. R.; Christou, J. C.; Dumas, C.; Enke, B. L. "Keck Adaptive-Optics Imaging of Near-Earth Asteroid 2005_YU55 During its 2011 Close Flyby", *LPI/ACM* **1667** 6372 (2012)
5. **Conrad, A.**; de Pater, I.; Kürster, M.; Herbst, T.; Kaltenegger, L.; Skrutskie, M.; Hinz, P. "Observing Io at high resolution from the ground with LBT", *EPSC-DPS* 795 (2011)
6. Drummond, J.; Merline, W. J.; **Conrad, A.**; Christou, J.; Tamblyn, P.; Carry, B. "Asteroid (19) Fortuna: Triaxial Ellipsoid Dimensions and Rotational Pole with AO at Gemini North", *EPSC-DPS* 1426 (2011)
7. Carry, B.; Kaasalainen, M.; Merline, W. J.; Drummond, J. D.; Durech, J.; Berthier, J.; **Conrad, A.** "KOALA: 3-D shape of asteroids from multi-data inversion", *EPSC-DPS* 490 (2011)
8. **Conrad, A.**; Carry, B.; Merline, W. J.; Drummond, J. D.; Chapman, C. R.; Tamblyn, P. M.; Christou, J. C.; Dumas, C.; Weaver, H. A.; Rosetta OSIRIS Instrument Team "The Irregular Shape of (21) Lutetia as Determined from Ground-based Observations" *AGU* P13C-1403 (2010)
9. Chapman, Clark R.; Merline, W. J.; Carry, B.; Weaver, H. A.; **Conrad, A.**; Drummond, J. D. "Pre-Rosetta Compositional Studies of Asteroid 21 Lutetia" *AAS/DPS* **42** 4603 (2011)
10. Carry, Benoit; Merline, W. J.; Kaasalainen, M.; **Conrad, A.**; Drummond, J. D.; Dumas, C.; Kueppers, M.; OSIRIS Instrument Team "The KOALA Shape Modeling Technique Validated at (21) Lutetia by ESA Rosetta Mission", *AAS/DPS* **42** 4602 (2011)
11. Merline, William J.; Carry, B.; Drummond, J. D.; **Conrad, A.**; Chapman, C. R.; Kaasalainen, M.; Leyrat, C.; Weaver, H. A.; Tamblyn, P. M.;

¹ LPSC - Lunar and Planetary Sciences Conference; AAS/DPS - American Astronomical Society Division of Planetary Sciences; ACM/LPI - Lunar Planetary Institute Colloquium on Asteroids, Comets, and Meteorites.

- Christou, J. C.; et al. "Pre-flyby Determination Of The Size, Shape, Pole, Density, And Satellites Of (21) Lutetia From Ground-based Observations", *AAS/DPS* **42** 4601 (2011)
12. **Conrad, A. R.**; Wooden, D.; Lucey, P.; Campbell, R. D.; Goodrich, R.; Merline, W. J.; Chapman, C. R. "Diffraction Limited Images of the Lunar Surface with Keck Adaptive Optics" *LPSC* **1533** 2533 (2010)
 13. Carry, B.; Merline, W. J.; Drummond, J. D.; Kaasalainen, M.; **Conrad, A.**; Leyrat, C.; Dotto, E.; Chapman, C. R.; Lutetia Koala Team "Shape/size/spin of Lutetia from ground-based observations", *EPSC* 666 (2010)
 14. **Conrad, A. R.**; Merline, W. J.; Drummond, J.; Carry, B.; Tamblyn, P. M.; Chapman, C. R.; Dumas, C.; Weaver, H. A. "Observations of Rosetta Target (21) Lutetia with Keck and Gemini Adaptive Optics" *AGU P43D-1463* (2009)
 15. Wooden, D. H.; Young, E. F.; Kelley, M. S.; Woodward, C. E.; Harker, D. E.; Disanti, M. A.; Lucey, P. G.; Hawke, R. B.; Goldstein, D. B.; Summy, D.; **Conrad A.R.**; et al. "Spectroscopy of the LCROSS Ejecta Plume from Keck, Gemini, and NASA IRTF Observatories on Mauna Kea" *LPSC* **1515** 74 (2009)
 16. Drummond, Jack D.; **Conrad, A.**; Merline, W.; Carry, B. "The Dimensions and Pole of Asteroid (21) Lutetia from Adaptive Optics Images", *AAS/DPS* **41** 59.07 (2009)
 17. Mumma, Michael J.; Villanueva, G. L.; Campbell, R.; Lyke, J.; **Conrad, A.**; Encrenaz, T.; Hartogh, P.; Kaufl, U.; Novak, R. E.; Tokunaga, A. "Tracing The Origin Of Methane And Water On Mars: Mapping Regions Of Active Release At Ultra-high Spatial Resolution Using Keck And VLT Under AO Control", *AAS/DPS* **41** 44.02 (2009)
 18. de Pater, Imke; Wong, M.; Luszcz-Cook, S.; Adamkovics, M.; Marcus, P.; Asay-Davis, X.; **Conrad, A.**; Go, C. "HST and Keck AO Images of Vortices on Jupiter", *AAS/DPS* **41** 10.03 (2009)
 19. **Conrad, A. R.**; Lyke, J. E.; Wooden, D.; Woodward, C.; Disanti, M.; Lucey, P. "Acquisition and Tracking of the LCROSS Impact Site with Keck-II", *LPI* **1483** 28 (2009)
 20. **A.R. Conrad**, W.J. Merline, J.D. Drummond, B. Carry, C. Dumas, R.D. Campbell, R.W. Goodrich, C.R. Chapman, P.M. Tamblyn, "Recent Results From Imaging Asteroids With Adaptive Optics," *40th LPSC*, No. 2414, 2009.
 21. **Conrad, A.R.**, Carry, B., Drummond, J.D., Merline, W.J., Dumas, C., Owen, W.M., Chapman, C.R., Tamblyn, P.M., Goodrich, R.W., Campbell, R.D., "Shape and Size of Asteroid (41) Daphne from AO imaging," *AAS/DPS* **40**, No. 28.12, 2008.
 22. Drummond, Jack D., Merline, W. J., **Conrad, A.**, Dumas, C., Carry, B., "Standard Triaxial Ellipsoid Asteroids from AO Observations," *AAS/DPS*, Vol. 40, No. 22.09, 2008.

23. **Conrad, A.R.**, Merline, W.J., Drummond, J.D., Carry, B., Dumas, C., Tamblyn, P.M., Chapman, C.R., Campbell, R.D., Goodrich, R.W., "Properties of 4 Asteroids from Keck Adaptive Optics," *ACM/LPI*, No. 1405, p. 8326, 2008.
24. Merline, W.J., **Conrad, A.R.**, Drummond, J.D., Carry, B., Dumas, C., Tamblyn, P.M., Chapman, C.R., Owen, W.M., Campbell, R.D., Goodrich, R.W. "Discovery of an Extreme Mass-Ratio Satellite of (41) Daphne in a Close Orbit," *ACM/LPI*, No. 1405, p. 8370, 2008.
25. Carry, B., Dumas, C., Kaasalainen, M., Berthier, J., Gil-Hutton, R., Merline, W. J., Drummond, J. D., Hestroffer, D., Fulchignoni, M., **Conrad, A.**, Erard, S., "Asteroid 2 Pallas: Evidence for an impact-crater," *ACM/LPI*, No. 1405, p. 8303, 2008.
26. **Conrad, A.R.**, Merline, W.J., Drummond, J.D., Carry, B., Dumas, C., Tamblyn, P.M., Campbell, R.D., Goodrich, R.W., et al., "Asteroid Shape Determination: A Comparison of AO Imaging With Lightcurve Inversion," *39th LPSC*, No. 1391, p. 2473, 2008.
27. **Conrad, A.**, Campbell, R., Goodrich, R., Le Mignant, D., Merline, W. J., Drummond, J. D., et al., "Keck Meets the Solar System," *AAS/DPS*, No. 34.06, Vol. 39, p.479, 2007.
28. Carry, Benoit, Kaasalainen, M., Dumas, C., Berthier, J., Merline, W. J., **Conrad, A.**, Hestroffer, D., et al., "Asteroid 2 Pallas Physical Properties from Near-Infrared High-Angular Resolution Observations," *AAS/DPS*, No. 30.08, Vol. 39, p.470, 2007.
29. **Conrad, A. R.**, Dumas, C., Merline, W. J., Drummond, J. D., Campbell, R. D., Goodrich, R. W., Le Mignant, D., Chaffee, F. H., Kwok, S. H., Knight, R. I., "Comparison of Three Asteroid Limb Profiles," *38th LPSC*, No. 1338, p.1492, 2007.
30. **A. R. Conrad**, C. Dumas, W. J. Merline, R. D. Campbell, R. W. Goodrich, D. Le Mignant, F. H. Chaffee, T. Fusco, S. H. Kwok, R. I. Knight, "Rotation and morphology of asteroid 511 Davida," *37th LPSC*, No. 1955, 2006.
31. Barczys, M., Larkin, J. E., Glassman, T. M., LaFreniere, D., Matthews, K., Althouse, W. E., Campbell, R. D., **Conrad, A.**, Egami, E., Goodrich, R. W., Honey, A., et al., "Faint Field Galaxies from $z \sim 1$ to 0.5 - New Merger Results from Keck AO and NIRC2," *AAS*, No. 94.11, Vol. 36, p.1497, 2004
32. Goodrich, R. W., Amico, P., Chaffee, F., **Conrad, A.**, et al., "Team Keck Treasury Redshift Survey," *AAS*, Vol. 35, p. 1405, 2003.
33. **A. Conrad**, D. Le Mignant, C. Dumas, W. Merline, et al, "Near-infrared imaging of large main-belt asteroids with the Keck adaptive optics system," *AAS/DPS*, No. 24.02, Vol. 35, p.959, 2003.
34. Marchis, F., Descamps, P., Berthier, J., Hestroffer, D., de Pater, I., **Conrad, A.**, Le Mignant, D., Chaffee, F., Gavel, D., "Searching and Studying Binary Asteroids with AO Systems," *AAS/DPS*, No. 24.03, Vol. 35, p.959, 2003.

35. Mumma, M. J., McLean, I. S., DiSanti, M. A., Larkin, J. E., Dello Russo, N., Magee-Sauer, K., Becklin, E. E., Bida, T., Chaffee, F., **Conrad, A. R.**, et al., "A survey of organic volatile species in comet C/1999 H1 (Lee) using NIRSPEC at the Keck Observatory," *DPS*, 32, 4404M (2000)
36. Barczys, M., Rich, R. M., Larkin, J., Matthews, K., Althouse, W. E., Campbell, R. D., **Conrad, A.**, Egami, E., Goodrich, R. W., Honey, A., et al., "A Keck/AO deep luminosity function of the Galactic Bulge in Baade's Window obtained using the NIRC2 camera," *AAS*, No. 91.12, Vol. 33, p.1439, 2001.

Papers Presented at Software Conferences (ADASS, SPIE, USENIX, and others²)

1. Hofferbert, Ralph; et al. "LINC-NIRVANA for the LBT: setting up the world's largest NIR binoculars for astronomy", *SPIE* **8511** 85110A (2012)
2. Yan, Zhaojun; Herbst, Thomas M.; Yang, Pengqian; Bizenberger, Peter; Zhang, Xianyu; **Conrad, Albert R.**; Bertram, Thomas; Kuerster, Martin; Rix, Hans-Walter; Li, Xinyang; Rao, Changhui "Measurement of non-common path static aberrations in an interferometric camera by phase diversity", *SPIE* **8417** 26 (2012)
3. Zhang, Xianyu; **Conrad, Albert R.**; Meschke, Daniel; Bertram, Thomas; Herbst, Thomas M.; Arcidiacono, Carmelo; Bizenberger, Peter; Gaessler, Wolfgang; Schreiber, Laura; Ragazzoni, Roberto; et al. "The LINC-NIRVANA high layer wavefront sensor laboratory experiment: progress report", *SPIE* **8447** 6H (2012)
4. Marafatto, Luca; et al. "Aligning a more than 100 degrees of freedom wavefront sensor", *SPIE* **8447** 6F (2012)
5. Brangier, Matthieu; **Conrad, Albert R.**; Bertram, Thomas; Zhang, Xianyu; Berwein, Juergen; Briegel, Florian; Herbst, Thomas M.; Ragazzoni, Roberto "Pupil rotation compensation for LINC-NIRVANA", *SPIE* **8447** 2U (2012)
6. **Conrad, Albert R.**; Arcidiacono, Carmelo; Baumeister, Harald; Bergomi, Maria; Bertram, Thomas; Berwein, Juergen; Biddick, Chris; Bizenberger, Peter; Brangier, Matthieu; Briegel, Florian; et al. "LINC-NIRVANA Pathfinder: testing the next generation of wave front sensors at LBT", *SPIE* **8447** 0V (2012)
7. Kittmann, Frank; Bertram, Thomas; **Conrad, Al**; Trowitzsch, Jan; Briegel, Florian; Berwein, Juergen; Mohr, Lars "LINC-NIRVANA Derotators", *AO4ELT* **2** P47 (2011)
8. Berwein, Juergen; Bertram, Thomas; **Conrad, Al**; Briegel, Florian; Kittmann, Frank; Zhang, Xiangyu; Mohr, Lars "End-To-End performance test of the LINC-NIRVANA Wavefront-Sensor system.", *AO4ELT* **2** P44 (2011)

² ADASS - Astronomical Data Analysis Software and Systems; SPIE - The International Society for Optical Engineering

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