Curriculum Vitae:

Walter Michael Harris
Associate Professor, Lunar and Planetary Laboratory
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Education:

University of Illinois (1982-1987): *Engineering Physics* (B.S.Eng.), *Astronomy* (B.S.)
University of Michigan (1987-1993): *Astronomy and Atmospheric and Space Sciences* (Ph.D)
Title of Thesis: *'Observation of Jovian auroral Ly-α line profile and emission variability with a sounding rocket and the IUE archives'*

Research Areas:

- Instrumentation for Ground and Space Based Remote Sensing
- Chemical, Dynamic, and Evolutionary Processes in the Coma of Comets
- Photochemical and Plasma Processes in Planet/Satellite Atmospheres and Magnetospheres
- Structure of the Heliopause and Interplanetary Medium

Position History:

University of Arizona:
Lunar and Planetary Laboratory: Associate Professor *2013-Present*
University of California Davis:
Department of Mechanical and Aerospace Engineering: Associate Professor *2011-2013*
Department of Applied Science: Associate Professor *2007-2011*
University of Washington:
Department of Earth and Space Sciences: Assistant Professor *2003-2007*

Recent Publications:

1. (2016) Dello-Russo, N., Vervack, H. Kawakita, A. Cochran, A. J. McKay, W. M. Harris, H. A. Weaver, C. M. Lisse, M. A. Disanti, H. Kobayashi, N. Biver. D. Bockelee-Morvan, J. Crovisier, C. Optiom, and E. Jehin, '*The compositional evolution of C/2012 S1 (ISON) from ground-based high-resolution infrared spectroscopy as part of a worldwide observing campaign*', Icarus, Volume 266, pp. 152-172.

2. (2015) Corliss, J. B., W. M. Harris, E. J. Mierkiewicz, and F. L. Roesler, '*Development and field tests of a narrowband all-reflective spatial heterodyne spectrometer'*, Applied Optics, Volume 54, pp. 8835-8843.

3. (2015) Mandt, K. E., Mousis, O., Marty, B., Cavalié, Harris, W., Hartogh, P., and K. Willacy, *'Constraints from comets on the cormation and volatile acquisition of the planets and satellites'*, Space Science Reviews, Volume 197, pp. 297-342.

4. (2015) Dalcanton, J., S. Seager, S. Aigrain, S. Battel, N. Brandt, C. Conroy, L. Feinberg, S. Gezari, O. Buyon, W. Harris, C. Hirata, J. Mather, M. Postman, D. Redding, D. Schiminiovich, H. Stahl, and J. Tumlinson, '*From cosmic births to living Earths: The future of UVOIR astronomy*', arXiv: 1507.04779, 177 pages.

5. (2015) McKay, A. J., Cochran, A. L., DiSanti, M. A., Villanueva, G., Dello-Russo, N., Vervack, R. J., Morgenthaler, J. P., Harris, W. M., and Chanover, N. J., *'Evolution of H_2O, CO, and CO_2 production in comet C/2009 P1 Garradd during the 2011-2012 apparition'*, Icarus, Volume 250, pp. 504-515.

6. (2014) Harris, W. M. and Corliss, J. B., *'Performance and validation of a suborbital FUV spatial heterodyne spectro-polarimeter for wide-field observations of Interplanetary Hydrogen'*, Space Telescopes and Instrumentation 2014: Ultraviolet to Gamma Ray: Proceedings of the SPIE, Volume 9144, Article ID 91442Y 11 pages.

7. (2014) Hosseini, S. and Harris, W. M., *'First calibration and visible wavelength observations of Khayyam, a tunable spatial heterodyne spectrometer'*, Ground-Based and Airborne Instrumentation for Astronomy V: Proceedings of the SPIE, Volume 9147, Article ID 91478L 9 pages.

8. (2014) Vincent, F. E., Katushkina, O., Ben-Jaffel, L., Harris, W. M., Izmodenov, V., Quémerais, E., Koutroumpa, D., and Clarke, J., *'Observations of Interplanetary Hydrogen during Solar Cycles 23 and 24: What can we deduce about the local Interstellar Medium?'*, Astrophysical Journal Letters, Volume 788, Issue 2, Article ID L25 6 pages.

9. (2014) Kawakita, H., Dello-Russo, N., Vervack, R. J., Kobayashi, H., DiSanti, M. A., Opitom, C., Jehin, E., Weaver, H. A., Cochran, A. L., Harris, W. M., Bockelée-Morvan, D., Biver, N., Crovisier, J., McKay, A. J., Manfroid, J., and Gillon, M., *'Extremely organic-rich coma of comet C/2010 (Hill) during its outburst in 2012'*, Astrophysical Journal, Volume 788, Issue 2, Article ID 110 7 pages.

10. (2014) McKay, A. J., Chanover, N. J., DiSanti, M. A., Morgenthaler, J. P., Cochran, A. L., Harris, W. M., and Dello-Russo, N., *'Rotational variation of daughter species production rates in comet 103P/Hartley: Implications for the progeny of daughter species and the degree of chemical heterogeneity'*, Icarus, Volume 231, pp. 193-205.

11. (2013) Lisse, C., A. Bar–Nun, D. Laufer, M. Belton, W. M. Harris, H. Hsieh, and D. Jewitt, *'Cometary Ices'*, Chapter 13: The Science of Solar System Ices, Astrophysics and Space Science Library, Volume 356, pp. 455-485.

12. (2013) Dello-Russo, N., Vervack Jr., R. J., Weaver, H. A., Lisse, C. M, Kawakita, H., Kobayashi, H., Cochran, A. L., Harris, W. M., Bockelée-Morvan, D., Biver, N., Crovisier, J., and McKay, A. J., *'A high-resolution infrared spectral survey of 103P/Hartley 2 on the night of the EPOXI closest approach'*, Icarus, Volume 222, Issue 2, pp. 707-722.

13. (2013) Kawakita, H., H. Kobayashi, N. Dello Russo, R. Vervack Jr., M. Hashimoto, H. A. Weaver, C. M. Lisse, A. L., Cochran, W. M. Harris, D. Bockelée-Morvan, N. Biver, J. Crovisier, A. J. McKay, *'Parent volatiles in comet 103P/Hartley 2 observed by Keck II with NIRSPEC during the 2010 apparition'*, Icarus, Volume 222, Issue 2, pp. 723-733.

14. (2013) McKay, A. J., N. J. Chanover, J. P. Morgenthaler, A. L. Cochran, W. M. Harris, and N. Dello Russo, *'Observations of the forbidden oxygen lines in DIXI target comet 103P/Hartley 2, Icarus'*, Volume 222, Issue 2, pp. 684-690.

15. (2012) McKay, A. J., N. J. Chanover, J. P. Morgenthaler, W. M. Harris, and N. Dello Russo, *'Forbidden oxygen lines in comets C/2006 W3 christensen and C/2007 Q3 Siding Spring at large heliocentric distance: Implications for the sublimation of volatile ices'*, Icarus, Volume 220, Issue 1, pp. 277-285.

16. (2012) Hosseini, S. S., Harris, W. M., and Corliss, J. B., *'Khayyam: a tunable spatial heterodyne spectrometer for observing diffuse emission line targets-First light results'*, Ground-Based and Airborne Instrumentation for Astronomy IV: Proceedings of the SPIE, Volume 8446, Article ID 84464K 11 pages.

17. (2012) Harris, W. M., Corliss, J. B., Bétrémieux, Y. and Roesler, F. L., *'Vacuum and environmental testing of an all-reflective spatial heterodyne spectrometer designed for wide input angle measurements of H Ly-α at high spectral resolving power'*, Space Telescopes and Instrumentation 2012: Proceedings of the SPIE, Volume 8443, Article ID 844330 8 pages.

18. (2011) Hosseini, S. S. and Harris, W. M., *'Khayyam: a second-generation tunable spatial heterodyne spectrometer for broadband observation of diffuse emission line targets'*, UV/Optica/IR Telescopes and Instruments: Innovative technologies and Concepts: Proceedings of the SPIE, Volume 8146, Article ID 814617 11 pages.

19. (2011) Morgenthaler, J. P., Harris, W. M., Combi, M. R., Feldman, P. D., and Weaver, H. A., *'GALEX FUV Observations of Comet C/2004 Q2 (MACHHOLZ): The ionization lifetime of Carbon'*, Astrophysical Journal', Volume 726, Number 1, Article ID 8 10 pages.

20. (2011) Meech, K. *et al* (with W. M. Harris), *'EPOXI: 103P/Hartley 2 observations from a worldwide campaign'*, Astrophysical Journal Letters, Volume 734, Issue 1, Article ID L1 9 pages.

21. (2011) Dello Russo, N., Vervack, R. J., Jr., Lisse, C. M., Weaver, H. A., Kawakita, H., Kobayashi, H., Cochran, A. L., Harris, W. M., McKay, A. J., Biver, N., Bockelée-Morvan, D., and Crovisier, J., *'The Volatile composition and activity of comet 103P/Hartley 2 during the EPOXI closest approach'*, Astrophysical Journal, Volume 734, Issue 1, Article ID L8 6 pages.

22. (2011) Vincent, F., Harris, W. M., Beasley, M., Corliss, J. B., Bétrémieux, Y., Ben Jaffel, L., and Roesler, F. L., *'Identification and treatment of an efficiency anomaly in a symmetrically ruled grating at normal incidence'*, Journal of Electron Spectroscopy and Related Phenomena, Volume 184, Number 3-6, pp. 346-349.

23. (2011) Vincent, F., Ben-Jaffel, L., and Harris, W. M., *'Updated analysis of the upwind Interplanetary Hydrogen velocity as observed by the Hubble Space Telescope during Solar Cycle 23'*, Astrophysical Journal, Volume 738, Issue 2, Article ID 10 pages.

24. (2010) Hosseini, S. S., Gong, A., Ruth, D., Baldis, H., and Harris, W. M., *'Tunable spatial heterodyne spectroscopy (TSHS): a new technique for broadband visible interferometry'*, Optical and Infrared Interferometry II: Proceedings of the SPIE, Volume 7734, Article ID 73343J 11 pages.

25. (2010) Bétrémieux, Y., Corliss, J., Vincent, M., Vincent, F., Roesler, F., and Harris, W. M., *'Description and ray-tracing simulations of HYPE: a far-ultraviolet polarimetric spatial-heterodyne spectrometer'*, Space Telescopes and Instrumentation 2010: Ultraviolet to Gamma Ray. Proceedings of the SPIE, Volume 7732, Article ID 83 12 pages.

26. (2010) Harlander, J., Lawler, J., Roesler, F. L., Corliss, J. C., and Harris, W. M., *'First results from an all- reflection spatial heterodyne spectrometer with broad spectral coverage'*, Optics Express, Volume 18, Issue 6, pp. 6205-6210.

27. (2009) Harris, W. M., *'High-resolution spectroscopic Campaigns to support spacecraft observations of comets with small telescopes'*, Earth, Moon, and Planets, Volume 105, Issue 2-4, pp. 351-359.

28. (2009) Dawson, O. R., and Harris, W. M., Tunable, *'All-reflective, Spatial Heterodyne Spectrometer for broadband spectral line coverage in the visible and near-ultraviolet'*, Applied Optics, Volume 48, Issue 21, pp. 4227-4238.

29. (2007) Morgenthaler, J. P., W. M. Harris, F. Scherb, and M. R. Combi, *'Large aperture [OI] 6300Å observation of comet Hyakutake: Implications for the photometry of OH and [OI] production in comet Hale-Bopp'*, Astrophysical Journal, Volume 657, Issue 2, pp. 1162-1171.