

NEO Surveyor-specific systems engineering qualifications package.

Dr. James W. Ashley; Section 394D;
Cross-trained and trainable systems engineer and scientist
with background in mission operations and NEO detection.

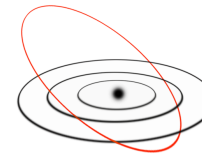
A. JPL Flight Project science operations experience

InSight mission; Science Plan Integrator, Science Integration Engineer, Deputy Science Operations Coordinator:

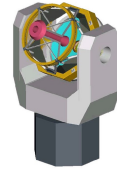


- Work 1.0 FTE with the Mission Planning and Sequencing Team to create, model, and prepare for uplink science and engineering activity plans on a weekly basis for science monitoring on the InSight mission. Work involves modeling within reduced energy environment, data and thermal constraints, spanning the mole penetration anomaly, and transition to Extended Mission operations.
- Lead SIE for conjunction planning 2021.
- JPL Certificate of Achievement award to the InSight solar array cleaning team for extraordinary performance in cleaning dust from solar arrays allowing for prolonged science acquisition; 2021.
- JPL award for exemplary performance of the Mission Planning and Sequencing Team in the generation of Sequences supporting Science and Mole Recovery; 2020.
- NASA Group Achievement Award, InSight Science and Instrument Operations; 2019.

B. Near Earth Object (NEO) discovery experience



MPR
MINOR PLANET RESEARCH, INC.



Director and co-founder for Minor Planet Research, Inc., 501(c)(3) charitable organization:

- My group worked through a Memorandum of Understanding with Lowell Observatory Near Earth Object Search (LONEOS) in Flagstaff, Arizona. Asteroid discoveries and co-discoveries using Lowell's ground-based 24-inch telescope include 1991 NT3, 2000 YA, 2001 FZ6, 2001 FA58, 2001 FX9, 2001 SQ263, 2001 OF84, 2001 OF25, 2001 FZ57, 2001 FF90, 2002 FC, 2003 GX, 2003 SQ222, and 2003 MC7. 2003 SQ222 was discovered by MPR staff at a remote location during testing of an educational module designed to permit student discoveries with both virgin and archived images. At a calculated distance of 54,680 miles, it was the closest object with a known orbit outside the Earth's atmosphere at the time of discovery.
- Campaigned for dedicated 2.4 m class search instruments in both hemispheres (see above design).
- EPO work with Discovery and History channels promoting awareness of smaller NEO impact hazard; 2004, 2006, 2007, 2010, & 2012. This is the target size range for NEO Surveyor.

C. Additional science and operations experience (MER); trained in thermal infrared 3.0-100 um

Mars Exploration Rovers

- Participating member of Science Operations Working Group as Mineralogy/Geochemistry Science Theme Group Lead.
- Payload Uplink Lead/Payload Downlink Lead on MER-A and MER-B, Miniature Thermal Emission Spectrometer.
- Initiated weathered meteorite identification and assessment campaign prior to landing (Ashley and Wright, 2004) through Phil Christensen (Mini-TES PI), with proof of concept (see publications).
- Principal Investigator - Assessing chemical and physical weathering processes on Mars using meteorites found near the Martian equator, Mars Data Analysis Program, NASA ROSES-2015; awarded \$366,870.



Ashley J. W., Golombek M. P., Herkenhoff K. E., Oij S. J., and the Athena Science Team. In-situ Morphometric Analysis of Iron Meteorites and their Oxide Coatings at Meridiani Planum – Support for Episodic Water Interaction and Persistent Wind Directions; *in preparation*.

Ashley J. W., C. Schröder, A. W. Tait, A. G. Tomkins, P. J. Boston, R. C. Wiens, D. F. Wellington, P-Y Meslin, A. C. McAdam, M. P. Golombek, M. A. Velbel, P. A. Bland, S. W. Ruff, J. F. Mustard, A. G. Curtis, S. Motaghian, B. L. Carrier, W. H. Farrand, M. D. Fries, P. Grindrod, A. Langedam, J. Lasue (2020) Continued Use of Exogenic Materials found on Mars as Planetary Research Tools. White paper submitted to: 2023-2032 Decadal Survey on Planetary Science and Astrobiology.

Ashley, J. W. (2015), The study of exogenic rocks on Mars — An evolving subdiscipline in meteoritics, *Elements*, vol. **11**, no. 1 (invited).

Ashley, J. W., M. P. Golombek, P. R. Christensen, S. W. Squyres, T. J. McCoy, C. Schröder, I. Fleischer, J. R. Johnson, K. E. Herkenhoff, and T. J. Parker (2011), Evidence for mechanical and chemical alteration of iron-nickel meteorites on Mars: Process insights for Meridiani Planum, *J. Geophys. Res.*, *116*, E00F20, doi:10.1029/2010JE003672.

D. Engineering assessment participation

NASA Postdoctoral Program Fellow

- Assisted landing site selection for InSight and Mars 2020 missions.
- Member of Council of Terrains for both missions.
- Work involved MRO HiRISE camera targeting, rock abundance assessment, terrain mapping, digital slope assessments, enabling terrain relative navigation feasibility studies, and support to EDL & traversability engineering teams.
- Co-mentor for 11 interns.

Golombek, M. P., D. Kipp, N. Warner, I. Daubar, R. Fergason, R. Kirk, R. Beyer, A. Huertas, S. Piqueux, N. Putzig, B. A. Campbell, G. A. Morgan, C. Constantinos, T. Pike, K. Gwinner, F. Calef, **J. W. Ashley**, D. Kass, M. Mischna, C. Bloom, N. Wigton, C. Schwartz, H. Gengl, L. Redmond, J. Sweeney, E. Sklyanskiy, M. Lisano, J. Benardino, S. Smrekar, and B. Banerdt (2016), Selection of the InSight landing site, *Space Science Reviews*, pp. 1-91, doi:10.1007/s11214-016-0321-9.

Calef III F. J., T. J. Parker, I. Daubar, **J. W. Ashley**, and M. P. Golombek. (June 2016) Geospatial data georeferencing and mosaicing for entry, descent, landing, and traverse site analysis. International Planetary Probe Workshop 13; APL, Laurel, MD.

Ashley J. W., M. P. Golombek, R. E. Otero*, F. J. Calef III, J. R. Michalski, and T. J. Parker. (June 2016) Terrain slope hazard characterization extrapolated from quantified analogs — training the human eye to see like a DTM for Mars 2020 landing site selection. International Planetary Probe Workshop 13; APL, Laurel, MD.

Otero R. E., M. P. Golombek, F. J. Calef, **J. W. Ashley**, and A. Huertas. (June 2016) Mars 2020 candidate landing site case study: Evolution of an ellipse placement. International Planetary Probe Workshop 13; APL, Laurel, MD.



InSight

E. Lunar Reconnaissance Orbiter Science Team

Postdoctoral Research Fellow;
Lunar Reconnaissance Orbiter Camera
Science Operations Center,
Arizona State University



- Research efforts focussed on the characterization and speleogenesis of lunar caves, impact melt dynamics, layering in mare deposits, and silicic volcanism on the Moon.

Ashley, J. W., M. S. Robinson, J. D. Stopar, T. D. Glotch, B. R. Hawke, S. J. Lawrence, B. L. Jolliff, B. T. Greenhagen, and D. A. Paige (2016), [The Lassell Massif — A Silicic Lunar Volcano](#), *Icarus*, vol. **273**, pp. 248-261, Special Issue: Lunar Reconnaissance Orbiter Part I, doi:10.1016/j.icarus.2015.12.036.

Robinson M. S., **J. W. Ashley**, A. K. Boyd, R. V. Wagner, E. J. Speyerer, B. R. Hawke, H. Hiesinger, C. H. van der Bogert, [Confirmation of sublunarean voids and thin layering in mare deposits](#), (2012) *Planet. Space Sci.*, **69**, pp. 18-27; doi:10.1016/j.pss.2012.05.008.

Ashley, J. W., M. S. Robinson, B. R. Hawke, C. H. van der Bogert, H. Hiesinger, H. Sato, E. J. Speyerer, A. C. Enns, R. V. Wagner, K. E. Young, and K. N. Burns (2012), [Geology of the King crater region: New insights into impact melt dynamics on the Moon](#), *J. Geophys. Res.* **117**, E00H29, doi:10.1029/2011JE003990. Also in *Results of The Lunar Reconnaissance Orbiter Mission*, (2012) *J. Geophys. Res.* Special Reprint Publication.

Timothy N. T., J. J. Wynne, M. J. Malaska, A. Agha-Mohammadi, P. B. Buhler, E. C. Alexander, **J. W. Ashley**, and others (2021) [A Roadmap for Planetary Caves Science and Exploration](#). *Nature Astronomy* **5**, 524–525. <https://doi.org/10.1038/s41550-021-01385-1>

F. Private Sector Project Management

Environmental liability management as certified
professional consulting hydrogeologist



Highlights include:

- Conducted hydrogeological investigations at over 250 sites nationwide spanning 15-year career track.
- Geophysical surveys (magnetometer, GPR, resistivity)
- Enhanced, dual-phase soil vapor extraction, groundwater sparging and bioremediation system design, installation, and operations in a variety of porous media.
- Project Manager of the Year awarded by Shell Oil Products US in 2002 while managing full inventory (57) of service station fuel product releases in Arizona for that company.
- Personal supervision of over two miles of cumulative borehole and water well installation drilling.
- Project manager for Ford Motor Company on private settlement negotiation with General Motors on \$150M cleanup at Willow Run B-24 Liberator Bomber Plant, Ypsilanti Michigan.
- Project manager for 593-well above ground fuel release site, Owensboro, Kentucky.