

Apollo 17 Lunar Ejecta And Meteorites Experiment Calibration Notebook Collection

Collection Overview

This collection contains a digital reproduction of one hand-written laboratory notebook of calibration analysis by Dr. Otto E. Berg for the Apollo 17 Lunar Ejecta And Meteorites (LEAM) Experiment. The notebook includes diagrams, plots, and notes pertaining to the data and operation of the LEAM experiment on the Moon. Dr. Berg used this work along with analyses of data acquired by the Pioneer 8 and 9 Cosmic Dust Detectors (CDD), which were identical to LEAM detector, to calibrate the Apollo 17 LEAM data. Digital reproductions of Dr. Berg's laboratory notebooks of calibration analysis for the Pioneer CDD's are archived separately in the PDS collection, "Pioneer 8 and 9 Cosmic Dust Detector Calibration Notebook Bundle". Dr. Berg was the principal investigator for all three instruments.

Digital Reproduction

As the principal investigator for these three dust detectors, Dr. Berg loaned his laboratory notebooks to the NASA Space Science Data Coordinated Archive (NSSDCA) for digital reproduction in January 2011. As the notebooks could not be unbound, NSSDCA staff mounted a 16 mega pixel, digital Nikon camera on a stable frame, then photographed each page of the notebook, including attached foldouts and loose pages. Foldouts were photographed folded, then unfolded and multiple photographs taken so that the entire wide page was imaged. For completeness, all loose pages were photographed individually and organized as they were located in the notebook at the time it was loaned to NSSDCA.

The NSSDCA converted the raw digital photograph files to JPEG format, arranged the JPEG files in the same order as the physical notebook, then merged the ordered JPEG files into one PDF/A-formatted file for each notebook. The filename for the digitally-reproduced LEAM notebook and the associated PDS label in this collection are:

a17_lem_calib_notebook.pdf

The NSSDCA prepared a table contents for the LEAM notebook and provided it as a PDF/A-formatted file with an associated PDS label:

a17_lem_calib_notebook_table_of_contents.pdf

Reproduction Quality

NSSDCA staff used one of the highest-resolution digital cameras at the time and endeavored to take the best possible photograph of each page, including re-photographing several items in an attempt to improve the quality. Staff noted the author used rubber cement to glue some pages together which, over time, significantly degraded the handwriting. Pen ink occasionally bled through one side of a page to the other, which decreased the legibility. The style of handwriting may be difficult to read; enlarging a PDF

page by 200-400% typically improves the legibility. Finally, the PDF notebooks are best displayed on a large, high-resolution computer screen.

Related PDS Dataset

Berg, O. E., and D. R. Williams, "Pioneer 8 and 9 Cosmic Dust Detector Calibration Notebook Bundle", NASA Planetary Data System, id: urn:nasa:pds:pioneer89cdd, 2017. Contains digital reproductions of two hand-written laboratory notebooks of calibration analyses for the Pioneer 8 and 9 Cosmic Dust Detectors by Dr. Berg.

References

- Apollo 17 Preliminary Science Report, NASA SP-330, published by NASA, Washington, D.C., 1973. (Available from the NASA Technical Reports Server (NTRS), <https://ntrs.nasa.gov/>)
- Apollo Scientific Experiments Data Handbook, NASA Technical Memorandum X-58131, JSC-09166, published by NASA Johnson Space Center, Houston, Texas, August 1974 (revised April 1976). (Available from the NTRS, <https://ntrs.nasa.gov/>)
- Auer, S. and O.E. Berg, Levitated lunar surface dust as evidenced by the LEAM experiment, In: Proceedings of European Planetary Science Congress 2008; Proceedings of the conference held 21-25 September 2008 in Munster, Germany, p. 705, 2008.
- Bates, J.R., W.W. Lauderdale, and H. Kernaghan, ALSEP Termination Report, NASA Reference Publication Series, NASA RF-1036, published by NASA Johnson Space Center, Houston, Texas, Apr. 1979. (Available from the NTRS, <https://ntrs.nasa.gov/>)
- Berg, O.E., F.F. Richardson, J.W. Rhee and S. Auer, Preliminary results of a cosmic dust experiment on the moon, Geophysical Research Letters, Volume 1, Issue 7, pp. 289-290, 1974. (doi:10.1029/GL001i007p00289)
- Berg, O.E., H. Wolf and J. Rhee, Lunar Soil Movement Registered by the Apollo 17 Cosmic Dust Experiment, In: Elsasser H., Fechting H. (eds); Interplanetary Dust and Zodiacal Light, Lecture Notes in Physics, Volume 48, Springer, Berlin, Heidelberg, 1976. (doi:10.1007/3-540-07615-8_486B)
- Davies, M.E., and T.R. Colvin, Lunar coordinates in the regions of the Apollo landers, Journal of Geophysical Research, Volume 105, Issue E8, pages 20,227-20,280, 2000. (doi:10.1029/1999JE001165)
- Grun, E., M. Horanyi and Z. Sternovsky, The lunar dust environment, Planetary and Space Science, Volume 59, Issue 14, pp. 1672-1680, 2011. (doi:10.1016/j.pss.2011.04.005)

Grun, E. and M. Horanyi, A new look at Apollo 17 LEAM data: Nighttime dust activity in 1976, *Planetary and Space Science*, Volume 89, pp. 2-14, 2013. (doi:10.1016/j.pss.2013.10.005)

O'Brien, B.J., Review of measurements of dust movements on the Moon during Apollo, *Planetary and Space Science*, Volume 59, Issue 14, pp. 1708-1726, 2011. (doi:10.1016/j.pss.2011.04.016)

Perkins, D.H., Final Report - Analysis of LEAM experiment response to charged particles, NASA-CR-147872, NASA contract no. NAS9-14751, Bendix Aerospace Systems Division, BSR 4234, 1976. (Available from the USRA Houston Repository, <https://repository.hou.usra.edu/handle/20.500.11753/43>, or NTRS, <https://ntrs.nasa.gov/>)

Rhee, J.W., O.E. Berg and H. Wolf, Electrostatic dust transport and Apollo 17 LEAM experiment, In: *Space research XVII; Proceedings of the Open Meetings of Working Groups on Physical Sciences, June 8-19, 1976 and Symposium on Minor Constituents and Excited Species, Philadelphia, Pa., June 9, 10, 1976. (A78-18101 05-42)* Oxford and New York, Pergamon Press, pp. 627-629, 1977. (Available from the NTRS, <https://ntrs.nasa.gov/>)

Tomandl, D.A. and O.E. Berg, An upper limit for the flux of interstellar dust grains in the solar system, In: *Space research XVII; Proceedings of the Open Meetings of Working Groups on Physical Sciences, June 8-19, 1976 and Symposium on Minor Constituents and Excited Species, Philadelphia, Pa., June 9, 10, 1976. (A78-18101 05-42)* Oxford and New York, Pergamon Press, pp. 631-635, 1977. (Available from the NTRS, <https://ntrs.nasa.gov/>)

Source

The NSSDCA provided this collection description.