

made on 11 negatively charged Apollo 17 dust grains, by illuminating them to UV radiation at wavelengths of 120 nm, 140 nm, and 160 nm (10.3 eV, 8.9 eV, 7.8 eV resp.). The effective radii of the 11 particles covered the range from 0.18 to 11.8 Pm. A composite plot of the photoelectric yields versus the size parameter, calculated for all the Apollo 17 dust grains, is shown in Fig. 2. The yields shown in the plots have been reduced to represent the values when the particle's surface potential approaches zero. The measurements on bulk lunar materials at the three corresponding wavelengths are also shown for comparison, as determined by Feuerbacher et al. [12]

Figure 2. Photoelectric yields of 11 dust grains selected from Apollo 17 sample 70051, with effective radii in the range of 0.18 to 11.8 Pm.

Conclusion: Plots of the photoelectric yields of individual dust grains, in Fig. 2, indicate a strong size dependence of the yields for size parameters less than ~ 100 , corresponding to particles of ~ 2 to 3 Pm radii, at wavelengths of 120-160 nm (photon energies of 7.8 eV to 10.3 eV). The yields increase with size by an order of magnitude from lower values for small particles to higher values for larger particles; these approach constant asymptotic values for particles larger than a few micron radii. The asymptotic values are found to be significantly higher than the bulk values given in the literature [12], by factors of ~ 14 to 38 for the corresponding photon energies.

Acknowledgements: This work was supported by the Science Directorate at NASA/MSFC under the IRAD program. We are grateful to: F. Six, J. Davis, A. Whitaker, and R. Koczor for their encouragement and support. We thank C. Ryland, J. Redmon, N. Martinez, and V. Coffey for assistance in the laboratory setup.

References: [1] McCoy, J.E. and D.R. Criswell, *Proc. Lunar Sci. Conf.*, 5th, 2991, 1974. [2] Rennilson, J.J. and D.R. Criswell, *The Moon*, 10, 121, 1974. [3] Berg, O.E., et al., *Earth Planet. Sci. Lett.*, 39, 377, 1978. [4] Pelizzari, M.A., and D.R. Criswell, *Proc. Lunar Planet. Sci. Conf.*, 9th, 3225, 1978. [5] Zook, H.A. and E. McCoy, *Geophys. Res. Lett.*, 18, 2117, 1991. [6] Horanyi, M., S. Robertson, and B. Walch, *Geophys. Res. Lett.*, 22, 2079, 1995. [7] Horanyi, M., B. Walch, S. Robertson, and D. Alexander, *J. Geophys. Res.*, 103, 8575, 1998. [8] Sickafoose et al., 2002. [9] Vondrak, R.R., T.J. Stubbs, and W.M. Farrell, Workshop on Dust in Planetary Systems, Kauai, HI, 2005. [10] Stubbs, T.J., R.R. Vondrak, W.M. Farrell, *Advances in Space Research*, 2005. [11] Abbas, M.M., D. Tankosic, P.D. Craven, R.B. Hoover, L.A. Taylor, J.F. Spann, A. LeClair, and E.A. West, *Proc. Dust in Plan. Sys.*, Kuai, HI, 2006. [12] Feuerbacher, B., M. Annderegg, B. Fitton, L.D. Laude, R.F. Willis, and R.J.L. Gard, *Supplement J. Geochemica et Cosmochimica Acta*, 3, 2655, 1972. [13] Watson, W.D., *ApJ.*, 176, 103, 1972. [14] Gallo, C.F., and W.L. Lama, *Jour. of Electrostatics*, 2, 145-150, 1976. [15] Draine, B.T., *ApJ. Supp.*, 36, 595, 1978. [16] Wong, K., S. Vongehr, and V.V. Kresin, *Phys. Rev. B*, 67, 035406, 2003. [17] Spann, J.F., M.M. Abbas, C.C. Venturini, and R.H. Comfort, *Physica Scripta*, T89, 147-153, 2001. [18] Abbas, M.M., P.D. Craven, J.F. Spann, E. West, J. Pratico, D. Tankosic, and C.C. Venturini, *Physica Scripta*, T98, 99-103, 2002. [19] Abbas, M.M., P.D. Craven, J.F. Spann, W.K. Witherow, E.A. West, D.L. Gallagher, M.L. Adrian, G.J. Fishman, D. Tankosic, A. LeClair, R. Sheldon, and E. Thomas Jr., *J. Geophys. Res.* 108, 1229, 2003. [20] Abbas, M.M., P.D. Craven, J.F. Spann, D. Tankosic, A. LeClair, D.L. Gallagher, E.A. West, J.C. Weingartner, W.K. Witherow, and A.G.G.M. Tielens, *ApJ.*, 614, 781-795, 2004.